SERIALS

# Computer Physics Communications

NORTH-HOLLAND PUBLISHING COMPANY – AMSTERDAM

ISSN 0 010-4655

# COMPUTER PHYSICS COMMUNICATIONS

*An international journal devoted to computational physics and computer programs in physics*



**Principal Editor**

P.G. Burke

School of Physics and Appl. Mathematics
The Queen's University of Belfast
Belfast BT7 1NN, N. Ireland

**Assistant to Editor and Program Librarian**

V.M. Burke

The Queen's University of Belfast

**Advisory Editors**

J.O. Hirschfelder, Madison, Wis. — M.J. Seaton, London, UK — A. Seeger, Stuttgart, Germany

**Editorial Policy Committee**

B. Gliss I.P. Grant F. James B.S. Nilsson R.M. Pengelly K.V. Roberts R. Taylor L.H. Underhill H. Van Regemorter

**Editors in Specialist Fields**

*Astrophysics*
A. Dalgarno, Cambridge, Mass.
I.P. Grant, Oxford, UK
D.G. Hummer, Boulder, Colo.
H. Van Regemorter, Meudon France

*Atomic and Molecular Processes*
K. Smith, Leeds, UK
K. Takayanagi, Tokyo, Japan

*Atomic Structure*
C.F. Fischer, Univ. Park, Penns.
D.A. Liberman, Los Alamos, N. Mex.

*Computer Science*
R.M. Pengelly, Bletchley, UK

*Crystallography*
J.M. Stewart, College Park, Catonsville, Md.

*Fluid Dynamics*
N.E. Hoskin, Reading, UK

*High Energy Nuclear Physics*
N. Govorun, Dubna, USSR
F. James, Geneva, Switzerland
G.R. Macleod, Geneva, Switzerland
M.J. Moravcsik, Eugene, Oreg.
B. Pardoe, Berkeley, Calif.
R. Taylor, Chilton, UK
H. Yoshiki, Ibaraki, Japan

*Low Energy Nuclear Physics*
H. Feshbach, Cambridge, Mass.
N.B. Gove, Oak Ridge, Tenn.
B.S. Nilsson, Copenhagen, Denmark
W.R. Smith, San Antonio, Tex.
T. Tamura, Austin, Tex.
H.A. Weidenmüller, Heidelberg, Germany

*Plasma Physics*
J. Killeen, Livermore, Calif.
K.V. Roberts, Abingdon, UK

*Quantum Chemistry*
J.C. Browne, Austin, Tex.
E. Clementi, San Jose, Calif.
G.G. Hall, Nottingham, UK
C. Moser, Orsay, France

*Reactor Physics*
M. Butler, Argonne, Ill.
L.H. Underhill, Risley, UK

*Solid State Physics*
J.R. Beeler, Jr., Raleigh, N.C.
K. Differt, Stuttgart, Germany
B. Gliss, Stuttgart, Germany
J. Nadrchal, Praha, Czechoslovakia
R.F. Wood, Oak Ridge, Tenn.

*Statistical Mechanics*
W.W. Wood, Los Alamos, N. Mex.



**Subscriptions:**

The subscription price of a volume is Dfl. 190.00 ($ 76.00); postage Dfl. 12.00 ($ 4.80).
Subscriptions should be sent to the publishers, North-Holland Publishing Company, P.O. Box 211, Amsterdam, or to any subscription agent.
Claims for missing numbers should be made within two months, following the date of publication. The publishers expect to supply missing numbers free only when losses have been sustained in transit and when the reserve stock will permit.


No part of this issue may be reproduced in any form, by print, photoprint, microfilm or any other means without written permission from the publishers.



Published montly. Printed in The Netherlands.

COMPUTER PHYSICS COMMUNICATIONS

# Computer Physics Communications

Editor:
P. G. BURKE
Queen's University of Belfast

CUMULATIVE INDEXES – Vols. 1–10
1976

EUROPHYSICS JOURNAL

NORTH-HOLLAND PUBLISHING COMPANY – AMSTERDAM

© North-Holland Publishing Company, Amsterdam, 1976

*All Rights Reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photo copying, recording or otherwise, without the prior permission of the Copyright owner*

PRINTED IN THE NETHERLANDS

Computer Physics Communications (1976)
© North-Holland Publishing Company

# CONTENTS OF VOLUMES 1–10

## COMPUTATIONAL PHYSICS


| *Vol.* | *Page* | |
|---|---|---|
| 1 | v | Introduction. P.G. Burke |
| 1 | vii | Editorial addresses. |
| 1 | x | Instructions to authors. |
| 1 | 1 | The publication of scientific FORTRAN programs. K.V. Roberts |
| 1 | 64 | The Program Library and how to become a subscriber. V.M. Burke |
| 1 | 141 | Editorial: Program annotation. P.G. Burke |
| 1 | 251 | LISP and its applications to physical problems. J.A. Campbell |
| 1 | 379 | Editorial. P.G. Burke |
| 1 | 473 | The C.P.C. Program Library. V.M. Burke |
| 1 | 477 | Book review. C.A.R. Hoare |
| 2 | 1 | The DELPHI—SPEAKEASY SYSTEM. I. Overall description. S. Cohen |
| 2 | 124 | The deferred difference correction for the Numerov method. C.F. Fischer |
| 2 | 238 | Book review. B. McNamara |
| 2 | 381 | On the evaluation of angular momentum coupling coefficients. J.G. Wills |
| 2 | 383 | Test programs (Letter to the Editor). I.P. Grant |
| 2 | 385 | Practical techniques in computer programming. K.V. Roberts |
| 3 | 69 | On the computation of third virial coefficients. C.H.J. Johnson, T.H. Spurling |
| 3 | 159 | Methods for the solution of optimization problems. R. Fletcher |
| 3 | 180 | Stirling FORDOC 01. A set of documentation conventions for FORTRAN packages and routines. D. Banks, I.C. Percival, J.McB. Wilson |
| 3 | 272 | Book review. P.G. Burke |
| 3 | 273 | Book review. D.C.S. Allison, D.Q.M. Fay |
| 3 | 273 | Book review. I.G. Cameron |
| 3 | 277 | DIRAC, dynamic information retrieval of atomic codes. I. Physical design criteria. A.R. Davies, K. Smith, K.L. Kwok |
| 3 | 296 | The OPTIME system for fitting theoretical expressions. P.H. Eberhard, W.O. Koellner |
| 3 | 314 | Graphical plotting output on a line printer using high—density plotting symbols. J.G. Cramer |
| 3s | v | Preface. G.R. Macleod |
| 3s | vi | Organizing committee. |

**COMPUTATIONAL PHYSICS (cont.)**

*Vol. Page*

3s vii List of participants.

3s 1 The impact of computers on atomic physics. P.G. Burke

3s 14 Topics in computational fluid mechanics. K.V. Roberts, J.P. Christiansen

3s 33 Geophysics. C.L. Pekeris

3s 50 Development of computer systems in physics. B. Zacharov

3s 63 Machine recognition of patterns in particle physics. P. Zanella

3s 75 Algebraic techniques. M. Veltman

3s 79 Contribution of computer simulation to plasma theory. J.M. Dawson

3s 86 Numerical experiments in statistical mechanics. B.J. Alder

3s 92 Nuclear potential—energy surfaces and the half—lives of heavy and super—heavy elements. S.G. Nilsson

3s 117 Impact of computers on meteorology. J.G. Charney

3s 127 Computation of electronic properties of solids. H.G. Junginger, W. van Haeringen, M.F.H. Schuurmans

3s 137 Analysis of biological structure at the atomic and molecular level. R.A. Crowther

3s 139 The heuristic value of computers in physics. J.R. Pasta

3s 151 Computer programs in astrophysics. H.C. Thomas

3s 157 Panel discussion, high—energy physics. B. French, F. James, L. Kowarski, M. Veltman, A. Zichichi

3s 166 Computing and scientific research in Europe. P. Aigrain

3s 174 Impact of computers on industrial research and development. H.B.G. Casimir

4 v Editorial. P.G. Burke

4 1 Direct numerical integration of coupled one—dimensional Schrodinger equations. M. Beiner, P. Gara

4 10 Numerical solution of the time—dependent Schrodinger equation. J.H. Weiner

4 11 An adaptive multidimensional quadrature procedure. A. Genz

4 16 The use of the R—matrix method in atomic calculations. W.D. Robb

4 20 Numerical solution of the eigenvalue problem of infinite matrices in molecular dynamics. E. Mathier, A. Attanasio, J. Keller, P. Nosberger, A. Bauder, Hs.H. Gunthard

4 27 Some physical applications of the solution of ill—conditioned systems of linear equations. J.J. Torsti, A.M. Aurela

4 33 Interactive graphical computing for simulating and unfolding measured distributions. J.T. Routti

4 40 On the filtering technique of the least squares estimation of parameters. W. Pachelski

4 47 Simple Monte Carlo simulation for solving methodological problems of detecting the extensive air showers electron component. T. Stanev

4 51 Application of the Monte Carlo method to the calibration of detectors for gamma—ray astronomy. R.D. Wills

**COMPUTATIONAL PHYSICS (cont.)**

*Vol. Page*

4 59 Monte Carlo calculation of hadronic cascades at high energy. J. Ranft

4 64 The computation of two—dimensional viscous flow through a T—junction. R.M. Blowers

4 73 Computer solutions of some transport phenomena problems. J.W. Schot

4 82 Automatic production of programs for solving partial differential equations by finite difference methods. M. Petravic, L.G.K. Petravic, K.V. Roberts

4 89 Numerical simulation of the evolution of a plasma in a confinement device. J.P. Boujot, C. Mercier—Soubbaramayer

4 95 Computer simulation of anisotropic magnetoplasma systems in cylindrical and toroidal geometry. W. Sharp, J.C. Taylor

4 100 Computation of the Einstein tensor with FORMAC. A.D. Payne

4 147 Book review. D.L. Moores

4 149 Book review. F.J. Smith

4 150 Book review. L.H. Sutcliffe

4 151 A recursive method for the approximate expansion of functions in a series of polynomials. E.L. Ortiz

4 157 Improper problems in computational physics. I.P. Nedelkov

4 165 The numerical solution of elliptic equations by the method of lines. D.J. Jones

4 173 Diffusion and heat conduction: a brief survey of numerical methods. W. Forster

4 182 New mathematical methods for analysing some nonlinear physics problems with the aid of a computer. E.P. Zhidkov

4 186 Explicit second order method of characteristics for quasilinear hyperbolic differential equations and applications. F. Demmig

4 193 Radiative correction in quantum electrodynamics. E. Remiddi

4 199 A REDUCE approach to the calculation of Feynman diagrams. J. Calmet

4 205 Generalisation of the Kahane algorithm for scalar products of gamma—matrices. J.S.R. Chisholm

4 208 Progress in Weyl's problem achieved by computational methods. H.P. Baltes, E.R. Hilf

4 214 Remarks on the computation of Coulomb wavefunctions. K.S. Kolbig

4 275 DESY on—line system. F. Akolk, H. Dilcher, H. Frese, G. Hochweller, P. Kuhlmann, E. Raubold

4 279 Hierarchical computing in laboratory experiments: potential and pitfalls. Y. Hazony

4 289 Application of multi—users on—line system to nuclear and solid—state physics at Gatchina's reactor WWR—M. V.I. Kadashevich, I.A. Kondurov, S.N. Nickolaev, Yu.F. Ryabov, V.I. Vinogradov

4 294 Automatic measurement of streamer chamber pictures. K. Eggert, W. Gurich, W. Moze, C. Stolze

4 299 A method for the automatic analysis of gamma ray events in astronomical spark chambers. G.F. Bignami, G. Cioni, A. della Ventura, P. Mussio, M.J.L. Turner, U. Volonte

4 315 Recognition of bubble chamber events exemplified by the Heidelberg automatic system. K. Brokate, R. Erbe, E. Keppel, D. Kropp, E. Grimm, H. Schneider, J. Wells

**COMPUTATIONAL PHYSICS (cont.)**

*Vol. Page*


4 327 Computer investigation of nonlinear dynamical problems of plasma theory. V.G. Makhankov, B.G. Shchinov

4 333 Two—dimensional computer simulation of high intensity proton beams. P. Lapostolle, R. le Bail

4 339 Convection in the presence of magnetic fields. R.S. Peckover, N.O. Weiss

4 345 Numerical experiments concerning isolated and non—isolated stellar systems. P. Bouvier

4 384 Book review. B.H. Bransden

5 1 Solitons and energy transport in nonlinear lattices. N.J. Zabusky

5 11 Numerical experiments on the statistical behaviour of dynamical systems with a few degrees of freedom. B.V. Chirikov, F.M. Izrailev, V.A. Tayursky

5 17 Computer simulation studies of the liquid state. P. Schofield

5 24 Numerical study of the electronic and thermodynamic properties of the metal — non—metal transition in dense media. X. Fortin, R. Schuttler

5 28 Melting of microcrystals in two dimensions: a molecular dynamics simulation. R.M.J. Cotterill, W.D. Kristensen, J.W. Martin, L.B. Pedersen, E.J. Jensen

5 32 Computer simulation in radiation damage studies. I.M. Torrens

5 44 The use of computers in electron— and ion—gun design. C. Weber

5 48 Some numerical investigations in nonlinear optics. V.V. Sobolev, V.S. Synakh, V.E. Zakharov

5 51 A computer simulation of the Adriatic sea for the study of its dynamics and for the forecasting of floods in the town of Venice. A.A. Tomasin

5 89 Intermediate—level programming languages for on—line data acquisition and control. R.D. Russell

5 98 The Durham elementary particle data bank, data analysis and model comparison project. F.D. Gault, B. Chadwick, C.S. Cooper, B.H. Bransden

5 104 Many—particle interaction problems computed by special purpose processors, with emphasis on the Ising model. E. Van der Schee, B.P.Th. Veltman, L. Speet, S. De Haan

5 115 Applications of computers and mathematical models to the study of neuronal systems. Nuclear and neuronal pulse spectrometry. B. Soucek

5 123 The OPIT system. I. A file—handling scheme for data in large applications programs. J.C. Packer, D.F. Brailsford

5 136 The OPIT system. II. Job control and scheduling for large applications programs. D.F. Brailsford, J.A. Prentice

5 147 A critical review of programs in atomic structure for bound states. C.F. Fischer

5 308 Erratum. A brief survey of numerical methods. W. Forster

5 309 Automatic peak analysis on minicomputers. E.D. von Meerwall, M.D. Gawlik

5 397 Book review. T.N.L. Patterson

5 399 Compilation of a catalogue of computer programs in electron optics. P.W. Hawkes

5 400 Software concepts for large application programs. R.K. Bock, E. Pagiola, J. Zoll

6 1 Computer generation of Feynman diagrams for perturbation theory. I. General algorithm. J. Paldus, H.C. Wong

**COMPUTATIONAL PHYSICS (cont.)**

*Vol. Page*

6 63 Book review. J.R. Beeler Jr.

6 65 The computation of fourth virial coefficients for pairwise—additive spherically symmetric interaction potentials. C.H.J. Johnson

6 96 Book review. A.E.A. Warburton

6 97 Book review. M.J. Norgett

6 157 Exact evaluation of Slater integrals using ALTRAN, a symbol manipulation language. C.F. Fischer, D.W.B. Prentice

6 195 High resolution graphical plotting on a typewriter terminal. D.M. Miller, G.E. Miller, D.P. Kerr

6 198 Difference methods for time—dependent two—dimensional convection. D.R. Moore, R.S. Peckover, N.O. Weiss

6 245 Preface. H. Van Regemorter

6 247 Close coupling. M.J. Seaton

6 257 Numerical methods in asymptotic regions. D.W. Norcross

6 265 Polarized orbital methods. J. Callaway

6 275 Matrix variational method. R.K. Nesbet

6 288 The R—matrix method in atomic physics. P.G. Burke

6 303 Fredholm calculation of electron—atom scattering amplitudes using Lxx2 basis sets. W.P. Reinhardt

6 316 Analytical and numerical procedures in the application of many—body Green's function methods to electron—atom scattering problems. L.D. Thomas, B.S. Yarlagadda, G. Csanak, H.S. Taylor

6 331 The use of analyticity in atomic scattering calculations. J. Nuttall

6 336 Faddeev—type coupled equations. J.C.Y. Chen

6 347 Monte Carlo methods for classical collisions between electrons and atoms. I.C. Percival

6 358 Eikonal theory of electron—atom collisions. C.J. Joachain

6 372 Higher Born, Pade and Schwinger variational methods. B.L. Moiseiwitsch

7 1 Chebyshev expansions for wave functions. V.B. Sheorey

7 63 Computation of area preserving mappings. J. Bernussou, N.F. Stewart

7 69 Numerical determination of the critical point in the 3—D Ising model in Wilson's formalism. Ph. Choquard, R.R. Sari, R. Calinon

7 115 Automatic spectrum analysis on minicomputers: doublet resolution by gaussian fit. E.D. von Meerwall, M.D. Gawlik

7 121 Subtracted generalized polylogarithms and the SINAC program. D. Maison, A. Petermann

7 135 Design criteria for a general purpose high—energy physics experiment simulation program. E. Vaccari, W. Delaney

7 174 Book review. E.W. Laing

7 175 Book review. B. Zacharov

7 179 EISPACK — a package of matrix eigensystem routines. B.S. Garbow

**COMPUTATIONAL PHYSICS (cont.)**

*Vol. Page*

7 235 Book review. D.F. Mayers

7 237 An introduction to the OLYMPUS system. K.V. Roberts

7 353 A method for calculating the algebra of matrix elements for photoionisation and line radiation. M. Jones

8 i Announcement. H.B.G. Casimir

8 iii Editorial. P.G. Burke

8 v Instructions to authors.

8 xi Editors in specialist fields.

8 1 Manual for SCHOONSCHIP. A CDC 6000/7000 program for symbolic evaluation of algebraic expressions. H. Strubbe

8 31 Errors in eigenvalues calculated by the Numerov—Cooley method. P.G. Guest

8 143 BATMAN — an automatic batch processing system. J. Clayton, R. Matthews, N. West

8 257 A numerical method for solving the radiative transfer equation in two—dimensional X—Y geometry. D. Ellison, I.P. Grant

8 270 Techniques for the calculation of atomic structures and radiative data including relativistic corrections. W. Eissner, M. Jones, H. Nussbaumer

8 337 The generalized eigenvalue problem in quantum chemistry. B. Ford, G. Hall

9 1 FORMAC routine for computing the matrix elements of the linearized cross—collision operators of gaseous mixtures. F.J. McCormack

9 69 Calculation of the dynamic response of reactor containment systems to full core explosions. M.S. Cowler, N.E. Hoskin, A.G. Rowlinson

9 79 Kinematic fitting: an improved method for convergence. D.J. Crennell, D.E. Hall

9 131 On the approximate solution of the delay integral equation of the statistical theory of radiation damage. J.M.F. Chamayou, M.E.A. El Tom

9 205 Computer—drawn trajectories of particles in mutual and external fields — an application of computers in university physics teaching. S. Brandt, H. Schneider

9 221 Program portability in high—energy physics. R.K. Bock

9 271 Two—level CAMAC handler software. L.M. Taff

9 337 A contribution to the efficient solution of extensive symbolic computations. W. Kerner, J. Steuerwald

10 73 A strategy for the numerical evaluation of Fourier sine and cosine transforms to controlled accuracy. A.J. Thakkar, V.H. Smith Jr.

10 80 Ring and other contributions to the higher virial coefficients. A.J. Thakkar, V.H. Smith Jr.

10 133 Complete crystal field calculations including spin—orbit interaction and paramagnetic effects. M.L. Ellzey Jr.

10 203 Systems aspects of large scale nuclear science programming. E.E. Ayoub, R.J. Ascuitto, D.A. Bromley

10 258 Book review. J.P. Christiansen

10 259 European Physical Society Computational Physics Group. D. Biskamp

**COMPUTATIONAL PHYSICS (cont.)**

*Vol. Page*

10 260 Summer school on computing techniques in physics. J. Nadrchal

10 262 SPYing on real—time computers to improve performance. L.M. Taff

10 264 Adiabatic relaxation to 1D MHD pressure equilibrium. EQUIL: a Fortran module and test program. K.V. Roberts, J.P. Christiansen, J.W. Long

10 282 Bicubic spline function approximation of the solution of the fast neutron transport equation. J.M.F. Chamayou

10 341 Announcement: CECAM activities in 1976.

10 438 Erratum. Ring and other contributions to the higher virial coefficients. A.J. Thakkar, V.H. Smith Jr.

**COMPUTER PROGRAMS IN PHYSICS**

*Vol. Page*

1 10 Ginzburg—Landau fluxoids. U. Kammerer

1 15 Fractional parentage coefficients for equivalent p shell and equivalent d shell electrons. D.C.S. Allison

1 21 A program to calculate Franck—Condon factors. A.C. Allison

1 25 Coulomb functions for complex energies. T. Tamura, F. Rybicki

1 31 A program to calculate radiative recombination coefficients of hydrogenic ions. D.R. Flower, M.J. Seaton

1 35 Computation of total, differential, and double—differential cross sections for compound nuclear reactions of the type (a,b), (a,bgamma) and (a,bgamma—gamma) (II) Generalized programs MANDY and BARBARA for arbitrary angular momenta in Hauser—Feshbach—Moldauer formalism. E. Sheldon, R.M. Strang

1 55 Nuclear bound state wave function subroutine. W.R. Smith

1 67 Versatile program for analysis of Mossbauer spectra. M.F. Bent, B.I. Persson, D.G. Agresti

1 88 Asymptotic solution of coupled equations for electron scattering. D.W. Norcross

1 97 A program for calculating Regge trajectories in potential scattering. P.G. Burke, C. Tate

1 106 Nuclear penetrability and phase shift subroutine. W.R. Smith

1 113 Relativistic and non—relativistic configuration interaction calculations for atoms having a closed core and two valence spin—orbitals. D.R. Beck, R.N. Zare

1 135 Parameter search subroutine. W.R. Smith

1 151 A multi—configuration Hartree—Fock program. C.F. Fischer

1 167 Computation of wavefunctions for the helium isoelectronic sequence. H.O. Knox

1 181 Hauser—Feshbach nuclear scattering subroutine LIANA. W.R. Smith

1 191 Vector coupling coefficients for complex atoms. H. Nussbaumer

1 198 Nuclear elastic scattering program with parameter search. W.R. Smith

**COMPUTER PROGRAMS IN PHYSICS (cont.)**

*Vol. Page*


1 207 Arbitrary 3n—j symbols for SU(2). J. Shapiro

1 216 Hartree Fock Slater self consistent field calculations. J.P. Desclaux

1 223 Erratum notice. A program to calculate Franck—Condon factors. A.C. Allison

1 224 Erratum. Computation of total, differential, and double—differential cross sections for compound nuclear reactions of the type (a,b), (a,bgamma) and (a,bgamma—gamma) (II) Generalized programs MANDY and BARBARA for arbitrary angular momenta in Hauser—Feshbach—Moldauer formalism. E. Sheldon, R.M. Strang

1 225 Coefficients of fractional parentage in j—j coupling in the isospin representation. L.B. Hubbard

1 232 Collision strengths from reactance matrices. H.E. Saraph

1 241 A program to calculate a general recoupling coefficient. P.G. Burke

1 265 Single—particle substitution sums in the second—order Z—expansion theory of atomic energies. M.N. Lewis

1 277 Isometric representation of two—dimensional matrices. A. Choudry

1 281 The Madelung potential and electric field intensity for a sodium chloride and for a caesium chloride lattice. U. Opik, R.F. Wood

1 291 Erratum. Ginzburg—Landau fluxoids. U. Kammerer

1 293 STLPLT—CALCOMP plot of crystallographic projections of Laue photographs. M. Canut—Amoros

1 306 A computer program for the calculation of electron scattering and photoionization cross sections of atomic systems with configuration (np)q. M.J. Conneely, L. Lipsky, K. Smith, P.G. Burke, R.J.W. Henry

1 325 Hydrogenic Rk integrals. M.N. Lewis

1 337 Angular momentum coupling coefficients. T. Tamura

1 343 Symmetric Neel walls in thin magnetic films. A. Hubert

1 349 I. Program for calculating degenerate Raman bands of symmetric tops with an adaptation for infrared bands. F.N. Masri, I.R. Williams

1 359 A general program for calculating angular momentum integrals in atomic structure. A. Hibbert

1 380 Computation of charge transfer probability between protons and excited hydrogen atoms. V. Malaviya

1 391 POLYMOL: a general program for the calculation of ground state wave functions for polymers. J.—M. Andre

1 415 An algorithm generating permutations with identical objects. P. Basso, C. Bourrely

1 420 Conversion of binary magnetic tapes. J. Goldberg

1 425 A Monte Carlo generation method with importance sampling for high energy collisions of hadrons. W. Kittel, L. Van Hove, W. Wojcik

1 437 A program to calculate the radial parts of interaction matrix elements between two hydrogenic wave functions as power series. M.J. Jamieson

1 440 Spectral intensity, angular distribution and polarisation of synchrotron radiation from a monoenergetic electron. J. Lang

1 445 Electron scattering by closed shell diatomic molecules. A.L. Sinfailam

**COMPUTER PROGRAMS IN PHYSICS (cont.)**

*Vol. Page*

1 453 Allowed values of coupled angular momentum and i—spin for nucleons in a single shell in j—j coupling. L.B. Hubbard

1 457 A program to generate numerical orbital functions. W.D. Robb

1 465 Program for fitting transition energies into a level scheme according to the combination principle. I.R. Williams

1 468 Symmetric Neel walls in thin magnetic films. An adaptation to increase the range of convergence. A. Hubert

1 469 Erratum notice. Single—particle substitution sums in the second—order Z—expansion theory of atomic energies. M.N. Lewis

1 469 Erratum notice. Hydrogenic Rk integrals. M.N. Lewis

1 470 Erratum. A computer program for the calculation of electron scattering and photoionization cross sections of atomic systems with configuration (np)q. M.J. Conneely, L. Lipsky, K. Smith, P.G. Burke, R.J.W. Henry

2 11 Symmetry and band structure. I. Selection of reciprocal lattice vectors. V. Hoffstein, O. Moller

2 17 Symmetry and band structure. II. Storage and retrieval of group theoretical information. V. Hoffstein, O. Moller

2 26 Symmetry and band structure. III. Construction of symmetrized Hamiltonian matrix. V. Hoffstein, O. Moller

2 33 Energy level calculations in Davydov model. S.M. Abecasis, F.R. Femenia, E.S. Hernandez

2 40 Computer—assisted analysis of gamma—ray spectra. G.D. Atkinson Jr., J.B. Whitworth, S.J. Gage

2 47 Transport collision integrals for a dilute gas. H. O'Hara, F.J. Smith

2 55 Printer—plotter routine. C.F. Moore

2 59 Derivation of the orbit of a double star from observations made with an intensity interferometer. D. Herbison—Evans

2 79 A procedure for nonlinear least squares refinement in adverse practical conditions. J. Lang, R. Muller

2 87 II. Program for calculating triply degenerate Raman bands of spherical tops with an adaptation for infrared bands. F.N. Masri, I.R. Williams

2 94 Distorted wave Born approximation for nuclear reactions. T. Tamura, W.R. Coker, F. Rybicki

2 107 Relativistic self—consistent field program for atoms and ions. D.A. Liberman, D.T. Cromer, J.T. Waber

2 114 Classical relative motion of 2 particles. D. Banks, I.C. Percival, J.McB. Wilson

2 127 FOUR67, a fast Fourier transform package. J.P. Christiansen, R.W. Hockney

2 139 DELSQPHI, a two—dimensional Poisson—solver program. J.P. Christiansen, R.W. Hockney

2 157 Solution of Poisson's equation in cylindrical coordinates. M.H. Hughes

2 168 CODNUM, a program to change the punching code and to number a deck of cards. F.R. Femenia

2 173 Erratum notice. Transport collision integrals for a dilute gas. H. O'Hara, F.J. Smith

2 173 Erratum notice. A program to calculate a general recoupling coefficient. P.G. Burke

**COMPUTER PROGRAMS IN PHYSICS (cont.)**

*Vol. Page*


2 174 Erratum notice. Angular momentum coupling coefficients. T. Tamura

2 175 A program for calculating relativistic elastic electron—atom collision data. A.C. Yates

2 180 A new version of a general program to calculate angular momentum integrals in atomic structure. A. Hibbert

2 181 Adaptation of NJSYM and GENSUM for use with Program WEIGHTS. A. Hibbert

2 191 Lanthanide crystal field fitting routine. G.E. Stedman

2 201 High speed evaluation of F0(x). L.L. Shipman, R.E. Christoffersen

2 207 The evaluation of the volume of the phase space of n particles. K. Kajantie, V. Karimaki

2 214 Rapid evaluation of four—body cluster contributions. G.P. Mueller

2 223 A program to calculate complex phase shifts and mixing parameters of elastic scattering of spin 1/2 particles on spin 1/2 targets. R. Kankowsky, D. Fick

2 231 Computation of Brody—Moshinsky brackets. A. Lejeune, J.P. Jeukenne

2 239 A program for atomic wavefunction computations by the parametric potential method. M. Klapisch

2 261 A program for calculating the static interaction potential between an electron and a diatomic molecule. F.H.M. Faisal, A.L.V. Tench

2 272 Computation of total, differential and double—differential cross sections for compound nuclear reactions of the type (a,b), (a,bgamma) and (a,bgamma—gamma). (III) FORTRAN translations of the ALGOL programs MANDY and BARBARA. E. Sheldon, S. Mathur, D. Donati

2 288 Programs to aid in establishing gamma—ray decay schemes, DCSCH3 and DCSCH4. B.P. Foster, D.C. Camp

2 298 I. A FORTRAN program for calculating degenerate Raman bands of symmetric tops with an adaptation for infrared bands. F.N. Masri, I.R. Williams

2 299 II. A FORTRAN program for calculating degenerate Raman bands of spherical tops with an adaptation for infrared bands. F.N. Masri, I.R. Williams

2 301 Computer simulation of extended defects in metals. R.E. Dahl Jr., J.R. Beeler Jr., R.D. Bourquin

2 322 Computer analysis of Mossbauer spectra. B.L. Chrisman, T.A. Tumolillo

2 331 Electromagnetic M1 reduced transition probabilities for pure and mixed Nilsson states in odd—A nuclei. E. Browne, F.R. Femenia

2 341 Program for calculating LEED intensities using band structure—matching formalism. V. Hoffstein

2 353 Bound state solution of the two—nucleon Schroedinger equation with tensor forces. L. Lovitch, S. Rosati

2 360 Amplitudes for scattering of electrons by hydrogenic and alkali—like atomic systems. D.L. Moores

2 368 Analysis of a variable spectroscopic double star. D. Herbison—Evans, N.R. Lomb

2 394 A track matching program for bubble chamber photographs. P.L. Bastien, J.N. Snyder, V. Pless

2 420 SU3 fractional parentage in the 1p—shell. J. Meyer, R.S. Nahabetian, J. Joseph, J. Lafoucriere

2 427 A program to calculate internal conversion coefficients for all atomic shells without screening. O. Dragoun, G. Heuser

2 433 Energy—loss straggling of heavy charged particles. R.G. Clarkson, N. Jarmie

**COMPUTER PROGRAMS IN PHYSICS (cont.)**

*Vol. Page*


2 443 Kinematical parameters of nuclear reactions. A. Wolfram, C.F. Moore, W.R. Coker

2 449 Gamma—radiation dosimetry for arbitrary source and target geometry. L.B. Hubbard

2 455 Calculation of electric quadrupole radial matrix elements for Coulomb excitation. M. Samuel, U. Smilansky

2 470 A new version of a printer—plotter routine. C.F. Moore

2 471 Erratum notice. Relativistic self—consistent field program for atoms and ions. D.A. Liberman, D.T. Cromer, J.T. Waber

3 1 A program for the extraction of bulk viscosities from sound absorption data. H. Moraal

3 9 Calculation of atomic energy level values. L.J. Radziemski Jr., K.J. Fisher, D.W. Steinhaus, A.S. Goldman

3 19 Wave number calculation from least—squares level values. L.J. Radziemski Jr., K.J. Fisher, D.W. Steinhaus, A.S. Goldman

3 22 Hartree—Fock nuclear calculations with gaussian potentials. J.F. Allard, A. Abzouzi, B. Houssais

3 31 Direct computation of the magnetic shell parameter. G. Kluge

3 36 Numerical fits for the geomagnetic shell parameter. G. Kluge, K.G. Lenhart

3 42 Trajectory calculations for the reaction K+HBr — KBr+H in the eV—region. A. van der Meulen

3 53 Generalized transformation brackets for the harmonic oscillator functions. M. Sotona, M. Gmitro

3 61 A Fortran program for the computation of the generalized Talmi coefficients. O. Zohni

3 73 Coulomb functions in entire (eta,rho)—plane. C. Bardin, Y. Dandeu, L. Gauthier, J. Guillermin, T. Lena, J.M. Pernet, H.H. Wolter, T. Tamura

3 88 Group—theoretical analysis of lattice vibrations. T.G. Worlton, J.L. Warren

3 118 Differential cross sections for electric quadrupole Coulomb excitation I. S.M. Lea, V. Joshi, A.B. Lopez—Cepero

3 130 Field and field gradient integrals based on gaussian type orbitals. O. Matsuoka

3 136 A program for the generation of artificial bubble chamber events. J. Bettels, P. Dodd

3 155 Computer generated Weyl groups. R.E. Beck, B. Kolman

3 173 The calculation of absorption and elastic cross sections using the optical potential. A.C. Allison

3 197 Classical relative motion of 2 particles (EVAR edition 02). D. Banks, I.C. Percival, J.McB. Wilson

3 221 Classical motion of 2 particles (EVA2 edition 01). D. Banks, I.C. Percival, J.McB. Wilson

3 240 POSITRONFIT: a versatile program for analysing positron lifetime spectra. P. Kirkegaard, M. Eldrup

3 256 Fine structure cross sections from reactance matrices. H.E. Saraph

3 269 Program ACQN to calculate transport collision integrals adapted to run on IBM computers. P.D. Neufeld, R.A. Aziz

3 275 Erratum notice. Distorted wave Born approximation for nuclear reactions. T. Tamura, W.R. Coker, F. Rybicki

3 276 Erratum notice. Coulomb functions for complex energies. T. Tamura, F. Rybicki

3 318 The reduced rotation matrix. W.J. Braithwaite, J.G. Cramer

**COMPUTER PROGRAMS IN PHYSICS (cont.)**

*Vol. Page*

3 322 The computation of the growth of a gaseous discharge in space—charge distorted fields. A.J. Davies, C.J. Evans

3 334 Numerical solution of the radial Schrodinger equation. F. Beleznay

3 339 Computer simulation of Mossbauer scattering spectra. J.L. Groves

4 107 A multi—configuration Hartree—Fock program with improved stability. C.F. Fischer

4 117 Recursive numerical integration of multi—particle phase space with peripheral matrix element. P. Pirila, E. Byckling

4 128 A program for computing level crossings and the Back—Goudsmit effect. P. Violino

4 138 The two—nucleon effective—range parameters with tensor forces. L. Lovitch, S. Rosati

4 221 Programs for computing the logarithm of the gamma function and the digamma function for complex argument. K.S. Kolbig

4 227 Relativistic kinematics for two—body final states. W.J. Braithwaite

4 233 Relativistic kinematics for three—body final states. W.J. Braithwaite

4 239 A nuclear Hartree—Fock intrinsic wavefunction projection program. J.F. Allard, N. Boumahrat, B. Houssais, M. Hadj Hassan, M. Lambert

4 249 External modes of molecular crystals. T.G. Worlton

4 257 A program for normalised Morse functions. J.R. Parkinson, D.T. Birtwistle

4 262 Energy level calculations with Arovmi model. S.M. Abecasis, F.R. Femenia

4 268 Vector coupling coefficients as products of prime factors. R.McD. Dodds, G. Wiechers

4 347 Geomagnetic field models: scalar and vector potential, induction vector and its gradient tensor computed by a common algorithm. G. Kluge

4 361 Symmetrized program for calculating energy bands and electronic structure of solids. V. Hoffstein, D.K. Ray, M. Belakhovsky

4 371 Computation of cross sections and polarizations for nuclear reactions, in which only spin 1/2 particles are involved. P. Heiss

4 377 CFPJJ—fractional parentage coefficients for equivalent electrons in jj—coupling. I.P. Grant

4 382 Erratum. Group—theoretical analysis of lattice vibrations. T.G. Worlton, J.L. Warren

5 56 A program for closed orbit minimization by analytic technique. J.V. Trotman

5 64 An expansion equation of state subroutine. K. Morgan

5 69 A nuclear optical model code for small computers. R.J. Eastgate, W.J. Thompson, R.A. Hardekopf

5 80 Program for evaluation of non—exchange type integrals required in electron—atom scattering theory using Slater—type orbitals as basis functions. R.L. Smith, D.G. Truhlar

5 153 Computation of effective Regge trajectories for high energy two—body reactions. D.J. Harrison, A.C. Irving, A.D. Martin

5 161 A program to calculate a general recoupling coefficient. I.P. Grant

5 163 Users manual for the OPTIME system. P.H. Eberhard, W.O. Koellner

5 217 Approximation formula and ALGOL program of the Lorentz—invariant momentum—space integral for particles of equal masses. A. Jabs

**COMPUTER PROGRAMS IN PHYSICS (cont.)**

*Vol. Page*

5 225 Computer simulations of Mossbauer spectra for an effective spin S—1/2 Hamiltonian. E. Munck, J.L. Groves, T.A. Tumolillo, P.G. Debrunner

5 239 Electron energy deposition in a gaseous mixture. L.R. Peterson, T. Sawada, J.N. Bass, A.E.S. Green

5 263 A general program to calculate angular momentum coefficients in relativistic atomic structure. I.P. Grant

5 283 Solution of differential equations for exchange matrix elements in heavy particle collisions. L.A. Parcell

5 294 Calculation of the radial distribution of emitters in a cylindrical source. R. Piessens

5 299 A routine for calculating the form—factor and the electrical resistivity of liquid N.F.E. metals. Md.M. Islam

5 304 Erratum notice. Computation of total, differential and double—differential cross sections for compound nuclear reactions of the type (a,b), (a,bgamma) and (a,bgamma—gamma). (III) FORTRAN translations of the ALGOL programs MANDY and BARBARA. E. Sheldon, S. Mathur, D. Donati

5 308 Erratum notice. A procedure for nonlinear least squares refinement in adverse practical conditions. J. Lang, R. Muller

5 315 The light curve of a variable star subject to orbital tidal distortion. D. Herbison—Evans

5 328 A program for the calculation of X—ray reflection intensities. I.F. Ferguson, J.E. Kirwan

5 349 An efficient partial—wave analyser for the absorption model. P.A. Collins, B.J. Hartley, R.W. Moore, K.J.M. Moriarty

5 365 Analytic formulation of SU(3) vector coupling coefficients for n particles. J.M. Casilio, M.E. Noz

5 379 Nearly exact calculation of the solution of the radial Schrodinger equation. L. Marquez

5 390 Associated Legendre polynomials, ordinary and modified spherical harmonics. W.J. Braithwaite

5 395 Erratum notice. Computer simulations of Mossbauer spectra for an effective spin S—1/2 Hamiltonian. E. Munck, J.L. Groves, T.A. Tumolillo, P.G. Debrunner

5 395 Erratum notice. Gamma—radiation dosimetry for arbitrary source and target geometry. L.B. Hubbard

5 396 Erratum notice. A program for calculating the static interaction potential between an electron and a diatomic molecule. F.H.M. Faisal, A.L.V. Tench

5 405 A user's guide to Fortran programs for Wigner and Racah coefficients of SU3. Y. Akiyama, J.P. Draayer

5 416 A new version of the program to compute the asymptotic solution of coupled equations for electron scattering. A.T. Chivers

5 417 A general program to study the scattering of particles by solving coupled inhomogeneous second—order differential equations. N. Chandra

5 430 Simulation of chemical profiles during electrotransport. D.L. Olson, J.L. Blough, T.S. Lakshmanan, D.A. Rigney

5 437 A finite element program package for axisymmetric scalar field problems. A. Konrad, P. Silvester

5 456 Program for calculating differential and integral cross sections for quantum mechanical scattering problems from reactance or transition matrices. M.A. Brandt, D.G. Truhlar, R.L. Smith

**COMPUTER PROGRAMS IN PHYSICS (cont.)**

*Vol. Page*

6 9 Computer generation of Feynman diagrams for perturbation theory. II. Program description. H.C. Wong, J. Paldus

6 17 Computation of S—state binding energy and wave functions in a Saxon—Woods potential. J. Cugnon

6 24 Freudenthal's inner multiplicity formula. B. Kolman, R.E. Beck

6 30 Nilsson orbits for a particle in a Woods—Saxon potential with Y20 and Y40 deformations, and coupled to core rotational states. B. Hird

6 38 Numerical evaluation of the formal solution of radiative transfer problems in spherical geometries. D.G. Hummer, C.V. Kunasz, P.B. Kunasz

6 59 Erratum notice. A new version of a general program to calculate angular momentum integrals in atomic structure. A. Hibbert

6 77 Phase shift analysis and consistency checks on electron—atom collision data. P.F. Naccache, M.R.C. McDowell

6 88 A new version of the program to compute the fractional parentage coefficients for equivalent d shell electrons. A.T. Chivers

6 89 Atomic integral containing three odd powers of interelectronic separation coordinates. A.H. Moussa, H.M.A. Radi

6 98 Erratum. A general program to calculate angular momentum coefficients in relativistic atomic structure. I.P. Grant

6 99 Computation of total and differential cross sections for compound nuclear reactions of the type (a,a), (a,a'), (a,b), (a,gamma), (a,gamma—gamma), (a,bgamma) and (a,bgamma—gamma). (IV) Fortran program CINDY. E. Sheldon, V.C. Rogers

6 132 A program to evaluate the reduced matrix elements of summations of one—particle tensor operators. W.D. Robb

6 149 Irreducible multiplier representations. T.G. Worlton

6 165 Dynamic information retrieval of atomic codes II. Implementation. A.R. Davies, K. Smith, K.L. Kwok

6 187 Kramers — Kronig analysis of reflection data. R. Klucker, U. Nielsen

6 221 A fast quadrature method for computing diatomic RKR potential curves. J. Tellinghuisen

6 229 A program calculating the formulae for polarization effects in nuclear reactions. F. Seiler

6 240 First collision gamma—ray dose. L.B. Hubbard

7 13 FORTRAN program to calculate finite—range no—recoil DWBA transfer cross sections. G.L. Payne, P.L. von Behren

7 38 Electron impact excitation cross sections. M.R.C. McDowell, L. Morgan, V.P. Myerscough

7 50 Program for calculating LEED intensities based on the inelastic collision model: I. Matrix inversion method. V. Hoffstein

7 73 A non—relativistic SCF atomic program to compute one—electron energies, total energies, and Slater integrals. J.H. Wood, M. Boring

7 85 Depth distribution of energy deposition by ion bombardment. I. Manning, G.P. Mueller

7 95 A program for the extraction of radiative lifetimes from experimental beam—foil intensity decay data. D.J.G. Irwin, A.E. Livingston

**COMPUTER PROGRAMS IN PHYSICS (cont.)**

*Vol. Page*

7 145 Energy—level calculations with the extended Arovmi model. S.M. Abecasis, F.R. Femenia

7 151 A flexible least squares routine for general Mossbauer effect spectra fitting. W. Wilson, L.J. Swartzendruber

7 163 A programming package for the calculation of cross—sections and probabilities for charge—exchange processes. J. Van den Bos

7 172 Program ACRL to calculate differential and integral cross sections adapted to run on IBM computers. M.A. Brandt, D.G. Truhlar, R.L. Smith

7 177 Erratum. Program for calculating differential and integral cross sections for quantum mechanical scattering problems from reactance or transition matrices. M.A. Brandt, D.G. Truhlar, R.L. Smith

7 185 Monte Carlo simulation of photons in two—layered media for density gauges. E.R. Christensen

7 192 Computer simulation of photons in spheric media for density gauges. E.R. Christensen

7 200 Inversion of Abel's integral equation — application to plasma spectroscopy. C. Fleurier, J. Chapelle

7 207 Calculation of crystal potentials. D.A. Papaconstantopoulos, W.R. Slaughter

7 215 Programs for the Landau and the Vavilov distributions and the corresponding random numbers. B. Schorr

7 225 A program to evaluate the reduced matrix elements of one particle tensor operators for the configurations in jj—coupling. J.J. Chang

7 236 Erratum notice. A multi—configuration Hartree—Fock program with improved stability. C.F. Fischer

7 245 OLYMPUS — a standard control and utility package for initial—value Fortran programs. J.P. Christiansen, K.V. Roberts

7 271 MEDUSA — a one—dimensional laser fusion code. J.P. Christiansen, D.E.T.F. Ashby, K.V. Roberts

7 289 Monte Carlo calculation of multiple scattering effects in thermal neutron scattering experiments. J.R.D. Copley

7 318 Adaptation of a general program to calculate angular momentum integrals in atomic structure: inclusion of the one—electron part of the hamiltonian. A. Hibbert

7 327 Monte Carlo programs for calculating three—dimensional high—energy (50 MeV—500GeV) hadron cascades in matter. J. Ranft, J.T. Routti

7 343 A version of a nuclear optical model code for small computers designed to run on a PDP—15. S.K. Datta, W.J. Thompson, D.O. Elliott

7 344 A program for the analytic simulation of extensive air showers. L. Goorevich

7 369 LEED intensity curves by the layer—by—layer method and perturbation calculation. J. Rundgren, A. Salwen

7 389 Form factor program for Rayleigh scattering of gamma rays by bound electrons. F. Smend, M. Schumacher

7 392 Nuclear energy loss and scattering of ions penetrating thin layers of matter. R. Skoog

7 401 POSITRONFIT EXTENDED: a new version of a program for analysing positron lifetime spectra. P. Kirkegaard, M. Eldrup

**COMPUTER PROGRAMS IN PHYSICS (cont.)**

*Vol. Page*


7 410 Calculation of the equilibrium structure and oscillations of polytropic stars pervaded by toroidal magnetic fields. M.J. Miketinac

7 419 Program for calculating work functions from photoelectric data. I.F. Kerr, C.H.B. Mee

8 35 Quantum mechanical coupled channels code for Coulomb excitation. F. Rosel, J.X. Saladin, K. Alder

8 49 Search program for significant variables. M.J. O'Connell

8 56 Multivariate least squares fitting program using modified Gram—Schmidt transformations. M.J. O'Connell

8 71 Improved version of group—theoretical analysis of lattice dynamics. J.L. Warren, T.G. Worlton

8 85 The hermitian matrix eigenproblem Hx — eSx using compact array storage. J.C. Nash

8 95 Racah's outer multiplicity formula. R.E. Beck, B. Kolman

8 101 Weizmann shell model computational code. R. Gross, Y. Accad

8 118 TIMER — a software instrumentation routine for making timing measurements. M.H. Hughes, A.P.V. Roberts

8 123 OLYMPUS restart facilities. M.H. Hughes, K.V. Roberts

8 130 PIRK: a computer program to calculate the elastic scattering of pions from nuclei. R.A. Eisenstein, G.A. Miller

8 141 Erratum notice. Irreducible multiplier representations. T.G. Worlton

8 149 A general program to calculate atomic continuum processes using the R—matrix method. K.A. Berrington, P.G. Burke, J.J. Chang, A.T. Chivers, W.D. Robb, K.T. Taylor

8 199 MIA, a FORTRAN—IV program for making spin and parity assignments to high—lying single and coherent twin nuclear levels from (alpha, nucleon) angular distributions in on—resonance, compound—nuclear, channel—spin—1/2 reactions. E. Sheldon, D.R. Donati, H.R. Hiddleston

8 220 A fixed core Hartree—Fock program for calculating bound and continuum orbitals. G.N. Bates

8 236 Analysis of the intensity distribution in the rotational structure of the electronic spectra of diatomic molecules by computer simulation. R.Ch. Baas, C.I.M. Beenakker

8 246 Fractional parentage coefficients for equivalent f shell electrons. D.C.S. Allison, J.E. McNulty

8 307 A numerical code for multiple water bag gravitational systems. S. Cuperman, A. Harten

8 320 Computer generation of connected graphs. D.C. Rapaport

8 329 Adaptation of a general program to calculate angular momentum integrals in atomic structure: inclusion of the checking of the configuration data. A. Hibbert

8 332 Erratum notice. Program for evaluation of non—exchange type integrals required in electron—atom scattering theory using Slater—type orbitals as basis functions. R.L. Smith, D.G. Truhlar

8 349 Exact finite range DWBA calculations for heavy—ion induced nuclear reactions. T. Tamura, K.S. Low

8 377 Coulomb wave functions for all real eta and rho. A.R. Barnett, D.H. Feng, J.W. Steed, L.J.B. Goldfarb

8 396 Bound—states of one nucleon in a Woods—Saxon well from a variational method. J.M. Delbrouck—Habaru, D.M. Dubois

9 11 COCHASE, a code for coupled channel Schrodinger equations. S. Hirschi, E. Lomon, N. Spencer

**COMPUTER PROGRAMS IN PHYSICS (cont.)**

*Vol. Page*


9 31 A multiconfiguration relativistic DIRAC—FOCK program. J.P. Desclaux

9 46 A subroutine and procedure for the rapid calculation of simple off—diagonal rational approximants. P.R. Graves—Morris, D.E. Roberts

9 51 OLYMPUS and preprocessor package for an IBM 370/165. M.H. Hughes, K.V. Roberts, P.D. Roberts

9 59 Monte Carlo calculation of multiple scattering effects in thermal neutron scattering experiments; modification to slab geometry. J.R.D. Copley

9 64 Monte Carlo calculation of multiple scattering effects in thermal neutron scattering experiments; modification to horizontal cylinder geometry. J.R.D. Copley

9 85 A plotting package for visual comparison of points and curves. J. Anderson, K.J.M. Moriarty, R.C. Beckwith

9 92 Program for spectra and cross—section calculations within the pre—equilibrium model of nuclear reactions. E. Betak

9 102 A general program to calculate the matrix of the spin—orbit interaction. W.—D. Klotz

9 117 A least—squares spectral curve fitting routine for strongly overlapping lorentzians or gaussians. E.D. von Meerwall

9 129 Erratum notice. Relativistic self—consistent field program for atoms and ions. D.A. Liberman, D.T. Cromer, J.T. Waber

9 141 CIV3 — a general program to calculate configuration interaction wave functions and electric—dipole oscillator strengths. A. Hibbert

9 173 Exact computation of the Zeeman effect on nuclear quadrupole resonance profiles for powders (spin I — 3/2). Determination of the asymmetry parameter. J. Darville, A. Gerard

9 182 Monte Carlo simulation of the diffractive excitation model. J. Kasman

9 193 A finite element program package for axisymmetric vector field problems. A. Konrad, P. Silvester

9 231 Numerical calculations of the irreducible representations of space groups. N. Neto

9 247 ILTHII — analysis of the spectrum of a thermal radioastronomical source. M. Salem

9 258 Computation of line and continuum radiation from thermal radioastronomical sources. M. Brocklehurst, M. Salem

9 268 Erratum notice. A program to evaluate the reduced matrix elements of summations of one—particle tensor operators. W.D. Robb

9 283 A program package for the Dirichlet problem with axially symmetric boundary conditions. J.B. Campbell

9 297 Rapidity generator for Monte—Carlo calculations of cylindrical phase space. S. Jadach

9 305 Colour coordinate calculations. D.L. Bradly, R. Perrin

9 312 Symmetrization and calculation of LEED intensity patterns. J. Rundgren, A. Salwen

9 327 Continuum exchange integrals for algebraic variational calculations of electron—atom scattering using Slater—type orbitals as basis functions. J. Abdallah Jr., D.G. Truhlar

9 351 A FORTRAN code for automatic spectrum analysis on medium—scale computers. E.D. von Meerwall

9 360 A general purpose Monte—Carlo program. P. Dufour, J. Schlesinger

**COMPUTER PROGRAMS IN PHYSICS (cont.)**

*Vol. Page*


9 370 A new version of AAKF (Reduced Tensor Matrix Elements) adapted to spectroscopic notation. C.F. Fischer, K.M.S. Saxena

9 381 Oscillator strengths from numerical MCHF radial functions. C.F. Fischer, K.M.S. Saxena

9 392 A computer program for internal conversion coefficients and particle parameters. H.C. Pauli, U. Raff

10 1 Eigenstates and eigenvalues of labelling operators for O(3) bases of U(3) representations. W. McKay, J. Patera, R.T. Sharp

10 11 THALIA — a one—dimensional magnetohydrodynamic stability program using the method of finite elements. K. Appert, D. Berger, R. Gruber, F. Troyon, K.V. Roberts

10 30 HYMNIA — band matrix package for solving eigenvalue problems. R. Gruber

10 42 A program for the calculation of X—ray reflection intensities, Part 2. I.F. Ferguson

10 56 Reduced matrix elements of summations of one—particle tensor products. W.—D. Klotz

10 67 Symmetry and bandstructure. J.Th.M. de Hosson

10 70 Erratum notice. A general program to calculate the matrix of the spin—orbit interaction. W.—D. Klotz

10 71 Erratum notice. Program for spectra and cross—section calculations within the pre—equilibrium model of nuclear reactions. E. Betak

10 87 Calculations of harmonic oscillator brackets. D.H. Feng, T. Tamura

10 98 Inversion of Abel's integral equation by a direct method. L.S. Fan, W. Squire

10 104 Normal coordinate analysis of crystals. J.Th.M. de Hosson

10 117 TLASER — a CO2 laser kinetics code. A.R. Davies, K. Smith, R.M. Thomson

10 145 A general—purpose routine for the analysis of spectroscopic peak shapes. E.D. von Meerwall

10 155 RAMSES: a two—dimensional, PIC type laser pulse propagation code. H.D. Dudder, D.B. Henderson

10 167 OLYMPUS control and utility package for the CDC 6500. M.H. Hughes, K.V. Roberts, G.G. Lister

10 182 Solution of bound state problems in nuclear shell model with momentum dependent potentials. M.A.K. Lodhi, B.T. Waak

10 194 Determination of SSOR—SI iteration parameters. J.B. Campbell

10 223 Multistate molecular treatment of atomic collisions in the impact parameter approximation. I. Integration of coupled equations and calculation of transition amplitudes for the straight line case. C. Gaussorgues, R.D. Piacentini, A. Salin

10 234 Calculation of Canterbury approximants. P.R. Graves—Morris, D.E. Roberts

10 245 Explicit formulas for Clebsch—Gordan coefficients. G. Rudnicki—Bujnowski

10 251 Erratum notice. MEDUSA — a one—dimensional laser fusion code. J.P. Christiansen, D.E.T.F. Ashby, K.V. Roberts

10 257 Erratum notice. Form factor program for Rayleigh scattering of gamma rays by bound electrons. F. Smend, M. Schumacher

10 293 Deformed quasiparticle states in a Woods—Saxon potential and coupled to rotational states of the core. B. Hird, K.H. Huang

**COMPUTER PROGRAMS IN PHYSICS (cont.)**

*Vol. Page*

10 304 Transfer of line radiation in optically thick media allowing for transport of excitation energy: the resonant doublet. C.V. Kunasz, P.B. Kunasz

10 343 MINUIT: a system for function minimization and analysis of the parameter errors and correlations. F. James, M. Roos

10 368 Vibrational energies of CO2. W.C. Maguire

10 375 Rovibrational cross sections from reactance matrices calculated in adiabatic nuclei approximation. R.J.W. Henry

10 385 Kinematics of three—body reactions. P.A. Assimakopoulos

10 401 PATIWEN — a code for Coulomb—nuclear interference calculations. D.H. Feng, A.R. Barnett

10 421 A finite element program package for magnetotelluric modelling. E. Kisak, P. Silvester

10 434 Erratum notice. A non—relativistic SCF atomic program to compute one—electron energies, total energies and Slater integrals. J.H. Wood, M. Boring

10 436 Erratum notice. CIV3 — a general program to calculate configuration interaction wave functions and electric—dipole oscillator strengths. A. Hibbert

Computer Physics Communications (1976)
© North-Holland Publishing Company

# PROGRAM INDEX TO VOLUMES 1–10

## Astrophysics

### *Cosmic Rays*

| *Vol.* | *Page* | *Cat.no.* | |
|---|---|---|---|
| 5 | 239 | ACRH | ELECTRON ENERGY LOSS (Fortran). Electron energy deposition in a gaseous mixture. L.R. Peterson, T. Sawada, J.N. Bass, A.E.S. Green. |
| 7 | 344 | AAYF | CASCADE (Fortran). A program for the analytic simulation of extensive air showers. L. Goorevich. |

### *Radiative Transfer*

| *Vol.* | *Page* | *Cat.no.* | |
|---|---|---|---|
| 5 | 294 | ABUE | ABELA (Fortran). Calculation of the radial distribution of emitters in a cylindrical source. R. Piessens. |
| 6 | 38 | AAAB | TRANSPHERE (Fortran). Numerical evaluation of the formal solution of radiative transfer problems in spherical geometries. D.G. Hummer, C.V. Kunasz, P.B. Kunasz. |

### *Radioastronomy*

| *Vol.* | *Page* | *Cat.no.* | |
|---|---|---|---|
| 1 | 31 | ACQD | HYDROGENIC RECOMBINATION COEFFS (Fortran). A program to calculate radiative recombination coefficients of hydrogenic ions. D.R. Flower, M.J. Seaton. |
| 9 | 247 | AAEF | ILTHII (Fortran). ILTHII — analysis of the spectrum of a thermal radioastronomical source. M. Salem. |
| 9 | 258 | AAEG | RCMBLN (Fortran). Computation of line and continuum radiation from thermal radioastronomical sources. M. Brocklehurst, M. Salem. Subroutine required by this program is AAEH. |
| 9 | 259 | AAEH | SELECT BN,CN VALUES (Fortran). Computation of line and continuum radiation from thermal radioastronomical sources. M. Brocklehurst, M. Salem. |

### *Stars and Stellar Systems*

| *Vol.* | *Page* | *Cat.no.* | |
|---|---|---|---|
| 2 | 59 | AACD | BIN DYN (Algol). Derivation of the orbit of a double star from observations made with an intensity interferometer. D. Herbison—Evans. |
| 2 | 114 | ACQT | EVAR (Fortran). Classical relative motion of 2 particles. D. Banks, I.C. Percival, J.McB. Wilson. See other version of this program ACRB. |
| 2 | 368 | AACE | BISPEC (Algol). Analysis of a variable spectroscopic double star. D. Herbison—Evans, N.R. Lomb. |

**Astrophysics (cont.)**
*Stars and Stellar Systems (cont.)*

| *Vol.* | *Page* | *Cat.no.* | |
|---|---|---|---|
| 3 | 197 | ACRB | EVAR EDITION 02 (Fortran). Classical relative motion of 2 particles (EVAR edition 02). D. Banks, I.C. Percival, J.McB. Wilson. See other version of this program ACQT. |
| 3 | 221 | ACRC | EVA2 EDITION 01 (Fortran). Classical motion of 2 particles (EVA2 edition 01). D. Banks, I.C. Percival, J.McB. Wilson. Subroutine required by this program is ACRB. |
| 5 | 315 | AACG | MAGBIN (Algol). The light curve of a variable star subject to orbital tidal distortion. D. Herbison—Evans. |
| 7 | 410 | AAAE | TOROID (Fortran). Calculation of the equilibrium structure and oscillations of polytropic stars pervaded by toroidal magnetic fields. M.J. Miketinac. |
| 8 | 307 | ACRU | WATER BAG MODEL (Fortran). A numerical code for multiple water bag gravitational systems. S. Cuperman, A. Harten. |

**Atomic Physics**
*Experimental Analysis*

| *Vol.* | *Page* | *Cat.no.* | |
|---|---|---|---|
| 1 | 440 | ACQR | SYNCHROTRON RADIATION (Fortran). Spectral intensity, angular distribution and polarisation of synchrotron radiation from a monoenergetic electron. J. Lang. |
| 3 | 322 | ABUD | SPARK71 (Fortran). The computation of the growth of a gaseous discharge in space—charge distorted fields. A.J. Davies, C.J. Evans. |
| 7 | 95 | AAED | HOMER (Fortran). A program for the extraction of radiative lifetimes from experimental beam—foil intensity decay data. D.J.G. Irwin, A.E. Livingston. |

*Scattering*

| *Vol.* | *Page* | *Cat.no.* | |
|---|---|---|---|
| 1 | 88 | ACQE | ASYM (Fortran). Asymptotic solution of coupled equations for electron scattering. D.W. Norcross. See other version of this program ACRK. |
| 1 | 232 | AAGB | SIMMEG (Fortran). Collision strengths from reactance matrices. H.E. Saraph. |
| 1 | 306 | AAIA | ATOMNP (Fortran). A computer program for the calculation of electron scattering and photoionization cross sections of atomic systems with configuration (np)q. M.J. Conneely, L. Lipsky, K. Smith, P.G. Burke, R.J.W. Henry. |
| 1 | 380 | ACQQ | H+ + H(2) CHARGE TRANSFER (Fortran). Computation of charge transfer probability between protons and excited hydrogen atoms. V. Malaviya. |
| 1 | 437 | ABWA | HYDROGENIC INTERACTION INTEGRAL (Fortran). A program to calculate the radial parts of interaction matrix elements between two hydrogenic wave functions as power series. M.J. Jamieson. |
| 1 | 457 | ACQS | NUMERICAL ORBITAL FUNCTIONS (Fortran). A program to generate numerical orbital functions. W.D. Robb. See other version of this program AAHE. |
| 2 | 47 | ACQN | TRANSPORT COLLISION INTEGRALS (Fortran). Transport collision integrals for a dilute gas. H. O'Hara, F.J. Smith. |

**Atomic Physics (cont.)**

*Scattering (cont.)*

| *Vol.* | *Page* | *Cat.no.* | |
|---|---|---|---|
| 2 | 173 | ACQN | 000A CORRECTION 10/03/71 (Fortran). Transport collision integrals for a dilute gas. H. O'Hara, F.J. Smith. |
| 3 | 269 | ACQN | 0001ACQN ADAPTED FOR IBM 360/75 (Fortran). Program ACQN to calculate transport collision integrals adapted to run on IBM computers. P.D. Neufeld, R.A. Aziz. |
| 2 | 114 | ACQT | EVAR (Fortran). Classical relative motion of 2 particles. D. Banks, I.C. Percival, J.McB. Wilson. See other version of this program ACRB. |
| 2 | 175 | ACQX | A SCAT (Fortran). A program for calculating relativistic elastic electron—atom collision data. A.C. Yates. |
| 2 | 360 | AAGH | SCATTERING AMPLITUDES (Fortran). Amplitudes for scattering of electrons by hydrogenic and alkali—like atomic systems. D.L. Moores. |
| 2 | 433 | ABON | STRAGL (Fortran). Energy—loss straggling of heavy charged particles. R.G. Clarkson, N. Jarmie. |
| 3 | 42 | AAGI | CLASSICAL TRAJECTORIES 324 (Algol). Trajectory calculations for the reaction K+HBr — KBr+H in the eV—region. A. van der Meulen. |
| 3 | 173 | AACF | SCATTERING BY COMPLEX POTENTIAL (Fortran). The calculation of absorption and elastic cross sections using the optical potential. A.C. Allison. |
| 3 | 197 | ACRB | EVAR EDITION 02 (Fortran). Classical relative motion of 2 particles (EVAR edition 02). D. Banks, I.C. Percival, J.McB. Wilson. See other version of this program ACQT. |
| 3 | 221 | ACRC | EVA2 EDITION 01 (Fortran). Classical motion of 2 particles (EVA2 edition 01). D. Banks, I.C. Percival, J.McB. Wilson. Subroutine required by this program is ACRB. |
| 3 | 256 | AAGJ | JAJOM (Fortran). Fine structure cross sections from reactance matrices. H.E. Saraph. |
| 3 | 334 | ACQZ | SCHROD (Fortran). Numerical solution of the radial Schrodinger equation. F. Beleznay. |
| 5 | 80 | AAGP | NETI (Fortran). Program for evaluation of non—exchange type integrals required in electron—atom scattering theory using Slater—type orbitals as basis functions. R.L. Smith, D.G. Truhlar. See other version of this program AAGT. |
| 8 | 332 | AAGP | 000ACORRECTION 19/07/74 (Fortran). Program for evaluation of non—exchange type integrals required in electron—atom scattering theory using Slater—type orbitals as basis functions. R.L. Smith, D.G. Truhlar. |
| 9 | 327 | AAGP | 0001 NETI/ETI (Fortran). Continuum exchange integrals for algebraic variational calculations of electron—atom scattering using Slater—type orbitals as basis functions. J. Abdallah Jr., D.G. Truhlar. |
| 5 | 81 | AAGT | NETIX (Fortran). Program for evaluation of non—exchange type integrals required in electron—atom scattering theory using Slater—type orbitals as basis functions. R.L. Smith, D.G. Truhlar. See other version of this program AAGP. |
| 8 | 332 | AAGT | 000ACORRECTION 19/07/74 (Fortran). Program for evaluation of non—exchange type integrals required in electron—atom scattering theory using Slater—type orbitals as basis functions. R.L. Smith, D.G. Truhlar. |
| 5 | 239 | ACRH | ELECTRON ENERGY LOSS (Fortran). Electron energy deposition in a gaseous mixture. L.R. Peterson, T. Sawada, J.N. Bass, A.E.S. Green. |

**Atomic Physics (cont.)**
*Scattering (cont.)*

| *Vol.* | *Page* | *Cat.no.* | |
|---|---|---|---|
| 5 | 283 | AAGU | SOLVE D.E. FOR MATRIX ELEMENTS (Fortran). Solution of differential equations for exchange matrix elements in heavy particle collisions. L.A. Parcell. |
| 5 | 379 | AAGN | YUKAWA/RHxxLP D JL 72 (Fortran). Nearly exact calculation of the solution of the radial Schrodinger equation. L. Marquez. |
| 5 | 416 | ACRK | ASYM VERSION FOR ICL 1900 (Fortran). A new version of the program to compute the asymptotic solution of coupled equations for electron scattering. A.T. Chivers. See other version of this program ACQE. |
| 5 | 417 | AAGO | SCAT (Fortran). A general program to study the scattering of particles by solving coupled inhomogeneous second—order differential equations. N. Chandra. Subroutine required by this program is ACRK. |
| 5 | 456 | ACRL | DCS (Fortran). Program for calculating differential and integral cross sections for quantum mechanical scattering problems from reactance or transition matrices. M.A. Brandt, D.G. Truhlar, R.L. Smith. |
| 7 | 172 | ACRL | 0001 ACRL ADAPTED FOR IBM360/370 (Fortran). Program ACRL to calculate differential and integral cross sections adapted to run on IBM computers. M.A. Brandt, D.G. Truhlar, R.L. Smith. |
| 6 | 77 | AAGV | SHIFTA (Fortran). Phase shift analysis and consistency checks on electron—atom collision data. P.F. Naccache, M.R.C. McDowell. |
| 6 | 89 | ACRO | ATOMINT (Fortran). Atomic integral containing three odd powers of interelectronic separation coordinates. A.H. Moussa, H.M.A. Radi. |
| 6 | 165 | AAIB | DIRAC (Fortran). Dynamic information retrieval of atomic codes II. Implementation. A.R. Davies, K. Smith, K.L. Kwok. |
| 6 | 166 | AAIC | DATBNK (Fortran). Dynamic information retrieval of atomic codes II. Implementation. A.R. Davies, K. Smith, K.L. Kwok. |
| 7 | 38 | AAGW | POLORB (Fortran). Electron impact excitation cross sections. M.R.C. McDowell, L. Morgan, V.P. Myerscough. |
| 7 | 163 | ACRP | IPFVAIJ (Fortran). A programming package for the calculation of cross—sections and probabilities for charge—exchange processes. J. Van den Bos. |
| 7 | 163 | ACRQ | IPFDEQ (Fortran). A programming package for the calculation of cross—sections and probabilities for charge—exchange processes. J. Van den Bos. Subroutine required by this program is ACRP. |
| 8 | 149 | AAHA | RMATRX STG1 (Fortran). A general program to calculate atomic continuum processes using the R—matrix method. K.A. Berrington, P.G. Burke, J.J. Chang, A.T. Chivers, W.D. Robb, K.T. Taylor. Subroutines required by this program are AAHE, AAHB, AAHC. |
| 8 | 150 | AAHB | RMATRX STG2 (Fortran). A general program to calculate atomic continuum processes using the R—matrix method. K.A. Berrington, P.G. Burke, J.J. Chang, A.T. Chivers, W.D. Robb, K.T. Taylor. Subroutines required by this program are ACRN, ACQB, ACQV, ACQV0001, AAHD, AAKF, AAHA, AAHC. |
| 8 | 150 | AAHC | RMATRX STG3 (Fortran). A general program to calculate atomic continuum processes using the R—matrix method. K.A. Berrington, P.G. Burke, J.J. Chang, A.T. Chivers, W.D. Robb, K.T. Taylor. Subroutines required by this program are AAHE, ACRK, AAHA, AAHB. |

**Atomic Physics (cont.)**
*Scattering (cont.)*

| *Vol.* | *Page* | *Cat.no.* | |
|---|---|---|---|
| 8 | 152 | AAHE | A NEW VERSION OF BASFUN (Fortran). A general program to calculate atomic continuum processes using the R—matrix method. K.A. Berrington, P.G. Burke, J.J. Chang, A.T. Chivers, W.D. Robb, K.T. Taylor. See other version of this program ACQS. |
| 10 | 223 | ACWJ | PAMPA (Fortran). Multistate molecular treatment of atomic collisions in the impact parameter approximation. I. Integration of coupled equations and calculation of transition amplitudes for the straight line case. C. Gaussorgues, R.D. Piacentini, A. Salin. |

*Spectroscopy*

| *Vol.* | *Page* | *Cat.no.* | |
|---|---|---|---|
| 1 | 31 | ACQD | HYDROGENIC RECOMBINATION COEFFS (Fortran). A program to calculate radiative recombination coefficients of hydrogenic ions. D.R. Flower, M.J. Seaton. |
| 1 | 306 | AAIA | ATOMNP (Fortran). A computer program for the calculation of electron scattering and photoionization cross sections of atomic systems with configuration (np)q. M.J. Conneely, L. Lipsky, K. Smith, P.G. Burke, R.J.W. Henry. |
| 1 | 440 | ACQR | SYNCHROTRON RADIATION (Fortran). Spectral intensity, angular distribution and polarisation of synchrotron radiation from a monoenergetic electron. J. Lang. |
| 1 | 465 | ABKD | RITZ COMBINATION PRINCIPLE (Fortran). Program for fitting transition energies into a level scheme according to the combination principle. I.R. Williams. |
| 2 | 239 | AAKC | MAPPAC (Fortran). A program for atomic wavefunction computations by the parametric potential method. M. Klapisch. |
| 2 | 288 | ABOF | DECAY SCHEME PROGRAM, DCSCH3 (Fortran). A program to aid in establishing gamma—ray decay schemes. B.P. Foster, D.C. Camp. |
| 2 | 289 | ABOG | DECAY SCHEME PROGRAM, DCSCH4 (Fortran). A program to aid in establishing gamma—ray decay schemes. B.P. Foster, D.C. Camp. |
| 2 | 427 | ABGF | INTERNAL CONVERSION COEFFICIENTS (Fortran). A program to calculate internal conversion coefficients for all atomic shells without screening. O. Dragoun, G. Heuser. |
| 3 | 9 | AAKD | LEVEL (Fortran). Calculation of atomic energy level values. L.J. Radziemski Jr., K.J. Fisher, D.W. Steinhaus, A.S. Goldman. |
| 3 | 19 | AAKE | CALOR (Fortran). Wave number calculation from least—squares level values. L.J. Radziemski Jr., K.J. Fisher, D.W. Steinhaus, A.S. Goldman. |
| 3 | 240 | AAGK | POSITRONFIT (Fortran). POSITRONFIT: a versatile program for analysing positron lifetime spectra. P. Kirkegaard, M. Eldrup. See other version of this program AAGX. |
| 4 | 128 | ACRD | BACK—GOUDSMIT (Fortran). A program for computing level crossings and the Back—Goudsmit effect. P. Violino. |
| 7 | 389 | AAGY | RAYLEIGH FORM FACTORS (Fortran). Form factor program for Rayleigh scattering of gamma rays by bound electrons. F. Smend, M. Schumacher. |

**Atomic Physics (cont.)**

*Spectroscopy (cont.)*

| *Vol.* | *Page* | *Cat.no.* | |
|---|---|---|---|
| 10 | 257 | AAGY | 000ACORRECTION 25/09/75 (Fortran). Form factor program for Rayleigh scattering of gamma rays by bound electrons. F. Smend, M. Schumacher. |
| 7 | 401 | AAGX | POSITRONFIT EXTENDED (Fortran). POSITRONFIT EXTENDED: a new version of a program for analysing positron lifetime spectra. P. Kirkegaard, M. Eldrup. See other version of this program AAGK. |
| 9 | 381 | ACRZ | GF VALUES (Fortran). Oscillator strengths from numerical MCHF radial functions. C.F. Fischer, K.M.S. Saxena. Subroutines required by this program are ACRF, AAKP. |
| 9 | 392 | ABGP | CATAR (Fortran). A computer program for internal conversion coefficients and particle parameters. H.C. Pauli, U. Raff. |

*Structure*

| *Vol.* | *Page* | *Cat.no.* | |
|---|---|---|---|
| 1 | 21 | AACA | FRANCK—CONDON FACTOR PROGRAM (Fortran). A program to calculate Franck—Condon factors. A.C. Allison. |
| 1 | 223 | AACA | 000A CORRECTION 21/10/70 (Fortran). A program to calculate Franck—Condon factors. A.C. Allison. |
| 1 | 113 | AAKA | SOCKITTOME 1 (Fortran). Relativistic and non—relativistic configuration interaction calculations for atoms having a closed core and two valence spin—orbitals. D.R. Beck, R.N. Zare. |
| 1 | 151 | ACQJ | MULTI—CONFIGURATION HARTREE—FOCK (Fortran). A multi—configuration Hartree—Fock program. C.F. Fischer. See other version of this program ACRF. |
| 1 | 167 | ACQK | TWO ELECTRON WAVEFUNCTIONS (Fortran). Computation of wavefunctions for the helium isoelectronic sequence. H.O. Knox. |
| 1 | 216 | ACQI | H.F.S. SELF CONSISTENT FIELD (Fortran). Hartree Fock Slater self consistent field calculations. J.P. Desclaux. |
| 1 | 265 | AACC | SPSS—ATOMIC Z—EXPANSION E2 PRIME (Fortran). Single—particle substitution sums in the second—order Z—expansion theory of atomic energies. M.N. Lewis. |
| 1 | 469 | AACC | 000A CORRECTION 27/07/70 (Fortran). Single—particle substitution sums in the second—order Z—expansion theory of atomic energies. M.N. Lewis. |
| 1 | 325 | AACB | RKDP—RK INTEGRALS(DOUBLE PREC.) (Fortran). Hydrogenic Rk integrals. M.N. Lewis. |
| 1 | 469 | AACB | 000A CORRECTION 24/06/70 (Fortran). Hydrogenic Rk integrals. M.N. Lewis. |
| 1 | 359 | ACQL | WEIGHTS (Fortran). A general program for calculating angular momentum integrals in atomic structure. A. Hibbert. Subroutines required by this program are ACQB, ACQC, AAGD, AAGD0002. See other version of this program ACQV. |
| 2 | 107 | AAKB | HEX (Fortran). Relativistic self—consistent field program for atoms and ions. D.A. Liberman, D.T. Cromer, J.T. Waber. |
| 2 | 471 | AAKB | 000A CORRECTION 11/08/71 (Fortran). Relativistic self—consistent field program for atoms and ions. D.A. Liberman, D.T. Cromer. J.T. Waber. |

**Atomic Physics (cont.)**
*Structure (cont.)*

| *Vol.* | *Page* | *Cat.no.* | |
|---|---|---|---|
| 2 | 471 | AAKB | 000B CORRECTION 02/09/71 (Fortran). Relativistic self—consistent field program for atoms and ions. D.A. Liberman, D.T. Cromer, J.T. Waber. |
| 9 | 129 | AAKB | 000CCORRECTION 18/11/74 (Fortran). Relativistic self—consistent field program for atoms and ions. D.A. Liberman, D.T. Cromer, J.T. Waber. |
| 2 | 180 | ACQV | WEIGHTS NEW VERSION (Fortran). A new version of a general program to calculate angular momentum integrals in atomic structure. A. Hibbert. Subroutines required by this program are ACQB, ACQC, AAGD, AAGD0001. See other version of this program ACQL. |
| 6 | 59 | ACQV | 000A CORRECTION 22/05/73 (Fortran). A new version of a general program to calculate angular momentum integrals in atomic structure. A. Hibbert. |
| 7 | 318 | ACQV | 0001ADAPT WEIGHTS FOR ONE PART (Fortran). Adaptation of a general program to calculate angular momentum integrals in atomic structure: inclusion of the one—electron part of the hamiltonian. A. Hibbert. Subroutines required by this program are ACQB, ACRN, AAGD, AAGD0001, AAGD0002. |
| 8 | 329 | ACQV | 0002ADAPT TO TEST CONFIG DATA (Fortran). Adaptation of a general program to calculate angular momentum integrals in atomic structure: inclusion of the checking of the configuration data. A. Hibbert. Subroutines required by this program are ACQB, ACRN, AAGD, AAGD0001, AAGD0002. |
| 2 | 239 | AAKC | MAPPAC (Fortran). A program for atomic wavefunction computations by the parametric potential method. M. Klapisch. |
| 3 | 9 | AAKD | LEVEL (Fortran). Calculation of atomic energy level values. L.J. Radziemski Jr., K.J. Fisher, D.W. Steinhaus, A.S. Goldman. |
| 3 | 19 | AAKE | CALOR (Fortran). Wave number calculation from least—squares level values. L.J. Radziemski Jr., K.J. Fisher, D.W. Steinhaus, A.S. Goldman. |
| 4 | 107 | ACRF | MCHF72 (Fortran). A multi—configuration Hartree—Fock program with improved stability. C.F. Fischer. See other version of this program ACQJ. |
| 7 | 236 | ACRF | 000ACORRECTION 2/01/74 (Fortran). A multi—configuration Hartree—Fock program with improved stability. C.F. Fischer. |
| 6 | 89 | ACRO | ATOMINT (Fortran). Atomic integral containing three odd powers of interelectronic separation coordinates. A.H. Moussa, H.M.A. Radi. |
| 7 | 73 | AAKG | HERSKLZARE (Fortran). A non—relativistic SCF atomic program to compute one—electron energies, total energies, and Slater integrals. J.H. Wood, M. Boring. |
| 10 | 434 | AAKG | 000A CORRECTION 5/09/75 (Fortran). A non—relativistic SCF atomic program to compute one—electron energies, total energies and Slater integrals. J.H. Wood, M. Boring. |
| 8 | 220 | ACRX | FIXED CORE HARTREE—FOCK (Fortran). A fixed core Hartree—Fock program for calculating bound and continuum orbitals. G.N. Bates. |
| 9 | 31 | ACRV | MULTICONFIGURATION DIRAC—FOCK (Fortran). A multiconfiguration relativistic DIRAC—FOCK program. J.P. Desclaux. Subroutines required by this program are ACRI, ACRJ, AAGD, AAGD0002. |
| 9 | 102 | AAKL | SPINORBITWEIGHTS (Fortran). A general program to calculate the matrix of the spin—orbit interaction. W.—D. Klotz. Subroutines required by this program are ACQB, ACQC, AAGD. |

**Atomic Physics (cont.)**
*Structure (cont.)*

| *Vol.* | *Page* | *Cat.no.* | |
|---|---|---|---|
| 10 | 56 | AAKL | 0001 WKAPPAKQ (Fortran). Reduced matrix elements of summations of one—particle tensor products. W.—D. Klotz. Subroutines required by this program are AAGD, ACQB, ACQC. |
| 10 | 70 | AAKL | 000A CORRECTION 18/07/75 (Fortran). A general program to calculate the matrix of the spin—orbit interaction. W.—D. Klotz. |
| 9 | 141 | AAKM | CIV3 A GENERAL C.I. PROGRAM (Fortran). CIV3 — a general program to calculate configuration interaction wave functions and electric—dipole oscillator strengths. A. Hibbert. Subroutines required by this program are ACQB, ACRN, AAGD, AAGD0001, AAGD0002, ACQV, ACQV0001, ACQV0002, AAKF. |
| 10 | 436 | AAKM | 000A CORRECTION 26/1/76 (Fortran). CIV3 — a general program to calculate configuration interaction wave functions and electric—dipole oscillator strengths. A. Hibbert. |

*Theoretical Methods (see also General Purpose)*

| *Vol.* | *Page* | *Cat.no.* | |
|---|---|---|---|
| 1 | 15 | ACQB | P SHELL C.F.P. (Fortran). Fractional parentage coefficients for equivalent p shell and equivalent d shell electrons. D.C.S. Allison. |
| 1 | 16 | ACQC | D SHELL C.F.P. (Fortran). Fractional parentage coefficients for equivalent p shell and equivalent d shell electrons. D.C.S. Allison. See other version of this program ACRN. |
| 1 | 191 | ACQH | VECTOR COUPLING COEFFICIENTS (Fortran). Vector coupling coefficients for complex atoms. H. Nussbaumer. |
| 1 | 359 | ACQL | WEIGHTS (Fortran). A general program for calculating angular momentum integrals in atomic structure. A. Hibbert. Subroutines required by this program are ACQB, ACQC, AAGD, AAGD0002. See other version of this program ACQV. |
| 2 | 180 | ACQV | WEIGHTS NEW VERSION (Fortran). A new version of a general program to calculate angular momentum integrals in atomic structure. A. Hibbert. Subroutines required by this program are ACQB, ACQC, AAGD, AAGD0001. See other version of this program ACQL. |
| 6 | 59 | ACQV | 000A CORRECTION 22/05/73 (Fortran). A new version of a general program to calculate angular momentum integrals in atomic structure. A. Hibbert. |
| 7 | 318 | ACQV | 0001ADAPT WEIGHTS FOR ONE PART (Fortran). Adaptation of a general program to calculate angular momentum integrals in atomic structure: inclusion of the one—electron part of the hamiltonian. A. Hibbert. Subroutines required by this program are ACQB, ACRN, AAGD, AAGD0001, AAGD0002. |
| 8 | 329 | ACQV | 0002ADAPT TO TEST CONFIG DATA (Fortran). Adaptation of a general program to calculate angular momentum integrals in atomic structure: inclusion of the checking of the configuration data. A. Hibbert. Subroutines required by this program are ACQB, ACRN, AAGD, AAGD0001, AAGD0002. |
| 4 | 377 | ACRI | CFPJJ — CFP IN JJ—COUPLING (Fortran). CFPJJ—fractional parentage coefficients for equivalent electrons in jj—coupling. I.P. Grant. |

**Atomic Physics (cont.)**

***Theoretical Methods (see also General Purpose) (cont.)***

| *Vol.* | *Page* | *Cat.no.* | |
|---|---|---|---|
| 5 | 263 | ACRJ | MCP (Fortran). A general program to calculate angular momentum coefficients in relativistic atomic structure. I.P. Grant. Subroutines required by this program are AAGD, AAGD0002, ACRI. |
| 6 | 9 | AAKH | P.T. DIAGRAM GENERATION (Fortran). Computer generation of Feynman diagrams for perturbation theory. II. Program description. H.C. Wong, J. Paldus. |
| 6 | 88 | ACRN | A NEW D SHELL CFP (Fortran). A new version of the program to compute the fractional parentage coefficients for equivalent d shell electrons. A.T. Chivers. See other version of this program ACQC. |
| 6 | 132 | AAKF | REDUCED TENSOR MATRIX ELEMENTS (Fortran). A program to evaluate the reduced matrix elements of summations of one—particle tensor operators. W.D. Robb. Subroutines required by this program are ACQB, ACRN, AAGD, AAGD0001. See other version of this program AAKP. |
| 9 | 268 | AAKF | 000ACORRECTION 14/11/74 (Fortran). A program to evaluate the reduced matrix elements of summations of one—particle tensor operators. W.D. Robb. |
| 7 | 225 | AAAD | RDMEJJ (Fortran). A program to evaluate the reduced matrix elements of one particle tensor operators for the configurations in jj—coupling. J.J. Chang. Subroutines required by this program are AAGD, AAGD0002, ACRI. |
| 8 | 246 | ACRY | F SHELL C.F.P. (Fortran). Fractional parentage coefficients for equivalent f shell electrons. D.C.S. Allison, J.E. McNulty. |
| 9 | 102 | AAKL | SPINORBITWEIGHTS (Fortran). A general program to calculate the matrix of the spin—orbit interaction. W.—D. Klotz. Subroutines required by this program are ACQB, ACQC, AAGD. |
| 10 | 56 | AAKL | 0001 WKAPPAKQ (Fortran). Reduced matrix elements of summations of one—particle tensor products. W.—D. Klotz. Subroutines required by this program are AAGD, ACQB, ACQC. |
| 10 | 70 | AAKL | 000A CORRECTION 18/07/75 (Fortran). A general program to calculate the matrix of the spin—orbit interaction. W.—D. Klotz. |
| 9 | 370 | AAKP | REDUCED TENSOR MATRIX ELEMENTS 2 (Fortran). A new version of AAKF (Reduced Tensor Matrix Elements) adapted to spectroscopic notation. C.F. Fischer, K.M.S. Saxena. Subroutines required by this program are ACQB, ACRN, AAGD, AAGD0001, AAGD0002. See other version of this program AAKF. |

**Crystallography**

| *Vol.* | *Page* | *Cat.no.* | |
|---|---|---|---|
| 1 | 293 | AASA | STLPLT (Fortran). STLPLT—CALCOMP plot of crystallographic projections of Laue photographs. M. Canut—Amoros. |
| 5 | 328 | AAQB | FIREFLY II (Fortran). A program for the calculation of X—ray reflection intensities. I.F. Ferguson, J.E. Kirwan. See other version of this program AAQC. |
| 10 | 42 | AAQC | FIREFLY IV (Fortran). A program for the calculation of X—ray reflection intensities, Part 2. I.F. Ferguson. Subroutine required by this program is AAQB. See other version of this program AAQB. |

**Electrostatics**

| *Vol.* | *Page* | *Cat.no.* | |
|---|---|---|---|
| 5 | 437 | ACSB | AXISYMM—SCALAR—HELMHOLTZ—FINTEL4 (Fortran). A finite element program package for axisymmetric scalar field problems. A. Konrad, P. Silvester. Subroutine required by this program is ACSD. See other version of this program ACSC. |
| 5 | 438 | ACSC | AXISYMM—SCALAR—HELMHOLTZ—FINTEL6 (Fortran). A finite element program package for axisymmetric scalar field problems. A. Konrad, P. Silvester. Subroutine required by this program is ACSD. See other version of this program ACSB. |
| 5 | 438 | ACSD | GENERATE (Fortran). A finite element program package for axisymmetric scalar field problems. A. Konrad, P. Silvester. |
| 9 | 193 | ACSE | AXISYMM—VECTOR—HELMHOLTZ—FINTEL6 (Fortran). A finite element program package for axisymmetric vector field problems. A. Konrad, P. Silvester. Subroutines required by this program are ACSC, ACSF. |
| 9 | 194 | ACSF | VECTR—FINTEL6—BLK—DATA—GENERATOR (Fortran). A finite element program package for axisymmetric vector field problems. A. Konrad, P. Silvester. |
| 9 | 283 | ABSB | DIRPAK (Fortran). A program package for the Dirichlet problem with axially symmetric boundary conditions. J.B. Campbell. |
| 10 | 194 | ABUM | MUCALC (Fortran). Determination of SSOR—SI iteration parameters. J.B. Campbell. |

**Fluid Dynamics**

| *Vol.* | *Page* | *Cat.no.* | |
|---|---|---|---|
| 2 | 47 | ACQN | TRANSPORT COLLISION INTEGRALS (Fortran). Transport collision integrals for a dilute gas. H. O'Hara, F.J. Smith. |
| 2 | 173 | ACQN | 000A CORRECTION 10/03/71 (Fortran). Transport collision integrals for a dilute gas. H. O'Hara, F.J. Smith. |
| 3 | 269 | ACQN | 0001ACQN ADAPTED FOR IBM 360/75 (Fortran). Program ACQN to calculate transport collision integrals adapted to run on IBM computers. P.D. Neufeld, R.A. Aziz. |
| 2 | 127 | ABUA | FOUR67 (Fortran). FOUR67, a fast Fourier transform package. J.P. Christiansen, R.W. Hockney. |
| 2 | 139 | ABUB | DELSQPHI (Fortran). DELSQPHI, a two—dimensional Poisson—solver program. J.P. Christiansen, R.W. Hockney. Subroutine required by this program is ABUA. |
| 2 | 157 | ABUC | DELSQRZ (Fortran). Solution of Poisson's equation in cylindrical coordinates. M.H. Hughes. Subroutine required by this program is ABUA. |
| 5 | 64 | ACSA | EOSEXP (Fortran). An expansion equation of state subroutine. K. Morgan. |
| 5 | 437 | ACSB | AXISYMM—SCALAR—HELMHOLTZ—FINTEL4 (Fortran). A finite element program package for axisymmetric scalar field problems. A. Konrad, P. Silvester. Subroutine required by this program is ACSD. See other version of this program ACSC. |
| 5 | 438 | ACSC | AXISYMM—SCALAR—HELMHOLTZ—FINTEL6 (Fortran). A finite element program package for axisymmetric scalar field problems. A. Konrad, P. Silvester. Subroutine required by this program is ACSD. See other version of this program ACSB. |

**Fluid Dynamics (cont.)**

| *Vol.* | *Page* | *Cat.no.* | |
|---|---|---|---|
| 5 | 438 | ACSD | GENERATE (Fortran). A finite element program package for axisymmetric scalar field problems. A. Konrad, P. Silvester. |
| 7 | 271 | ABUG | MEDUSA (Fortran). MEDUSA — a one—dimensional laser fusion code. J.P. Christiansen, D.E.T.F. Ashby, K.V. Roberts. Subroutine required by this program is ABUF. |
| 10 | 251 | ABUG | 000A CORRECTION 15/8/75 (Fortran). MEDUSA — a one—dimensional laser fusion code. J.P. Christiansen, D.E.T.F. Ashby, K.V. Roberts. |
| 9 | 193 | ACSE | AXISYMM—VECTOR—HELMHOLTZ—FINTEL6 (Fortran). A finite element program package for axisymmetric vector field problems. A. Konrad, P. Silvester. Subroutines required by this program are ACSC, ACSF. |
| 9 | 194 | ACSF | VECTR—FINTEL6—BLK—DATA—GENERATOR (Fortran). A finite element program package for axisymmetric vector field problems. A. Konrad, P. Silvester. |
| 10 | 194 | ABUM | MUCALC (Fortran). Determination of SSOR—SI iteration parameters. J.B. Campbell. |

**General Purpose**
*Algebras and Rotation Groups*

| *Vol.* | *Page* | *Cat.no.* | |
|---|---|---|---|
| 1 | 207 | AAYA | 3N—J SYMBOLS FOR SU(2) (Fortran). Arbitrary 3n—j symbols for SU(2). J. Shapiro. |
| 1 | 241 | AAGD | NJSYM (Fortran). A program to calculate a general recoupling coefficient. P.G. Burke. See other version of this program AAHD. |
| 2 | 173 | AAGD | 000A CORRECTION 10/03/71 (Fortran). A program to calculate a general recoupling coefficient. P.G. Burke. |
| 2 | 181 | AAGD | 0001 ADAPT NJSYM FOR WEIGHTS (Fortran). Adaptation of NJSYM and GENSUM for use with Program WEIGHTS. A. Hibbert. |
| 5 | 161 | AAGD | 0002 ADAPT TO INTEGER ARITHMETIC (Fortran). A program to calculate a general recoupling coefficient. I.P. Grant. |
| 1 | 337 | ABMA | GEOMETRICAL COEFFICIENT (Fortran). Angular momentum coupling coefficients. T. Tamura. |
| 2 | 174 | ABMA | 000A CORRECTION 19/01/71 (Fortran). Angular momentum coupling coefficients. T. Tamura. |
| 1 | 415 | ACQP | PERMID (Fortran). An algorithm generating permutations with identical objects. P. Basso, C. Bourrely. |
| 3 | 155 | ACRA | WEYL GROUP (Fortran). Computer generated Weyl groups. R.E. Beck, B. Kolman. |
| 3 | 318 | ABOR | DS (Fortran). The reduced rotation matrix. W.J. Braithwaite, J.G. Cramer. |
| 4 | 268 | ACRE | COEF (Fortran). Vector coupling coefficients as products of prime factors. R.McD. Dodds, G. Wiechers. |
| 5 | 365 | AAWA | SU(3)VCC (Fortran). Analytic formulation of SU(3) vector coupling coefficients for n particles. J.M. Casilio, M.E. Noz. |
| 5 | 405 | ACRM | SU3 WIGNER & RACAH COEFFICIENTS (Fortran). A user's guide to Fortran programs for Wigner and Racah coefficients of SU3. Y. Akiyama, J.P. Draayer. |

**General Purpose (cont.)**

*Algebras and Rotation Groups (cont.)*

| *Vol.* | *Page* | *Cat.no.* | |
|---|---|---|---|
| 6 | 24 | AAAA | FREUD (Fortran). Freudenthal's inner multiplicity formula. B. Kolman, R.E. Beck. |
| 8 | 95 | AAAG | RACOUT (Fortran). Racah's outer multiplicity formula. R.E. Beck, B. Kolman. Subroutine required by this program is AAAA. |
| 8 | 151 | AAHD | A NEW VERSION OF NJSYM (Fortran). A general program to calculate atomic continuum processes using the R—matrix method. K.A. Berrington, P.G. Burke, J.J. Chang, A.T. Chivers, W.D. Robb, K.T. Taylor. See other version of this program AAGD. |
| 10 | 1 | ABID | EIGLAB (Fortran). Eigenstates and eigenvalues of labelling operators for O(3) bases of U(3) representations. W. McKay, J. Patera, R.T. Sharp. |
| 10 | 245 | ACWL | CLEBSCH—GORDAN EXPLICIT FORMULAS (Formac). Explicit formulas for Clebsch—Gordan coefficients. G. Rudnicki—Bujnowski. |

*Feynman Diagrams*

| *Vol.* | *Page* | *Cat.no.* | |
|---|---|---|---|
| 6 | 9 | AAKH | P.T. DIAGRAM GENERATION (Fortran). Computer generation of Feynman diagrams for perturbation theory. II. Program description. H.C. Wong, J. Paldus. |
| 8 | 320 | ACOA | GRAFFITI (Fortran). Computer generation of connected graphs. D.C. Rapaport. |

*Mathematical Functions*

| *Vol.* | *Page* | *Cat.no.* | |
|---|---|---|---|
| 1 | 25 | ABOC | COULOM (Fortran). Coulomb functions for complex energies. T. Tamura, F. Rybicki. |
| 3 | 276 | ABOC | 000A CORRECTION 18/03/72 (Fortran). Coulomb functions for complex energies. T. Tamura, F. Rybicki. |
| 2 | 127 | ABUA | FOUR67 (Fortran). FOUR67, a fast Fourier transform package. J.P. Christiansen, R.W. Hockney. |
| 3 | 73 | ABOQ | COULOM FOR REAL ENERGY (Fortran). Coulomb functions in entire (eta,rho)—plane. C. Bardin, Y. Dandeu, L. Gauthier, J. Guillermin, T. Lena, J.M. Pernet, H.H. Wolter, T. Tamura. |
| 4 | 221 | ACRG | CLOGAM AND CDIGAM (Fortran). Programs for computing the logarithm of the gamma function and the digamma function for complex argument. K.S. Kolbig. |
| 5 | 390 | ABME | LEGENDRE (Fortran). Associated Legendre polynomials, ordinary and modified spherical harmonics. W.J. Braithwaite. |
| 8 | 377 | ABPC | RCWFN (Fortran). Coulomb wave functions for all real eta and rho. A.R. Barnett, D.H. Feng, J.W. Steed, L.J.B. Goldfarb. |
| 9 | 46 | ACRT | ALGOL CALCULATION OF SODS (Algol). A subroutine and procedure for the rapid calculation of simple off—diagonal rational approximants. P.R. Graves—Morris, D.E. Roberts. See other version of this program ACRS. |

**General Purpose (cont.)**

*Mathematical Functions (cont.)*

| *Vol.* | *Page* | *Cat.no.* | |
|---|---|---|---|
| 9 | 46 | ACRS | FORTRAN CALCULATION OF SODS (Fortran). A subroutine and procedure for the rapid calculation of simple off—diagonal rational approximants. P.R. Graves—Morris, D.E. Roberts. See other version of this program ACRT. |
| 10 | 234 | ACWF | FORTRAN CALCULATION OF C.A'S (Fortran). Calculation of Canterbury approximants. P.R. Graves—Morris, D.E. Roberts. See other version of this program ACWG. |
| 10 | 234 | ACWG | ALGOL CALCULATION OF C.A'S (Algol). Calculation of Canterbury approximants. P.R. Graves—Morris, D.E. Roberts. See other version of this program ACWF. |

*Matrices*

| *Vol.* | *Page* | *Cat.no.* | |
|---|---|---|---|
| 1 | 277 | ACQM | MATPLT (Fortran). Isometric representation of two—dimensional matrices. A. Choudry. |
| 8 | 85 | AAAF | COMPLEX GENERALISED EIGENPROBLEM (Fortran). The hermitian matrix eigenproblem Hx — eSx using compact array storage. J.C. Nash. |
| 10 | 30 | ACWC | HYMNIA (Fortran). HYMNIA — band matrix package for solving eigenvalue problems. R. Gruber. |

*Minimization and Fitting*

| *Vol.* | *Page* | *Cat.no.* | |
|---|---|---|---|
| 1 | 135 | ABOD | SEARCH (Fortran). Parameter search subroutine. W.R. Smith. |
| 1 | 198 | ABOD | 0001 ADAPT SEARCH TO ELASTIC (Fortran). Adaptation of subroutine SEARCH for use with Program ELASTIC. W.R. Smith. |
| 2 | 79 | ABGA | NONLINEAR LEAST SQUARES FIT (Fortran). A procedure for nonlinear least squares refinement in adverse practical conditions. J. Lang, R. Muller. |
| 5 | 308 | ABGA | 000A CORRECTION 20/11/72 (Fortran). A procedure for nonlinear least squares refinement in adverse practical conditions. J. Lang, R. Muller. |
| 5 | 56 | ABCF | COMBAT (Fortran). A program for closed orbit minimization by analytic technique. J.V. Trotman. |
| 5 | 163 | AAYB | OPTIME SYSTEM (Fortran). Users manual for the OPTIME system. P.H. Eberhard, W.O. Koellner. |
| 8 | 49 | ABCG | LINCOM (Fortran). Search program for significant variables. M.J. O'Connell. |
| 8 | 56 | ABCH | GSFIT (Fortran). Multivariate least squares fitting program using modified Gram—Schmidt transformations. M.J. O'Connell. |
| 10 | 343 | ACWH | MINUIT (Fortran). MINUIT: a system for function minimization and analysis of the parameter errors and correlations. F. James, M. Roos. |

**General Purpose (cont.)**

*Plotting*

| *Vol.* | *Page* | *Cat.no.* | |
|---|---|---|---|
| 1 | 277 | ACQM | MATPLT (Fortran). Isometric representation of two—dimensional matrices. A. Choudry. |
| 2 | 55 | ABOI | PLOTT (Fortran). Printer—plotter routine. C.F. Moore. See other version of this program ABOO. |
| 2 | 470 | ABOO | PLOTT NEW VERSION (Fortran). A new version of a printer—plotter routine. C.F. Moore. See other version of this program ABOI. |
| 9 | 85 | AAUN | APLOT (Fortran). A plotting package for visual comparison of points and curves. J. Anderson, K.J.M. Moriarty, R.C. Beckwith. |

*Utility*

| *Vol.* | *Page* | *Cat.no.* | |
|---|---|---|---|
| 1 | 420 | ABCA | CONV (Fortran). Conversion of binary magnetic tapes. J. Goldberg. |
| 2 | 168 | ACQU | CODNUM (Fortran). A program to change the punching code and to number a deck of cards. F.R. Femenia. |
| 7 | 245 | ABUF | OLYMPUS (Fortran). OLYMPUS — a standard control and utility package for initial—value Fortran programs. J.P. Christiansen, K.V. Roberts. See other versions of this program ABUJ, ABUK. |
| 8 | 118 | ABUH | TIMER (Fortran). TIMER — a software instrumentation routine for making timing measurements. M.H. Hughes, A.P.V. Roberts. |
| 8 | 123 | ABUI | LEDGER (Fortran). OLYMPUS restart facilities. M.H. Hughes, K.V. Roberts. |
| 9 | 51 | ABUJ | OLYMPUS FOR IBM 370/165 (Fortran). OLYMPUS and preprocessor package for an IBM 370/165. M.H. Hughes, K.V. Roberts, P.D. Roberts. See other versions of this program ABUF, ABUK. |
| 10 | 167 | ABUK | OLYMPUS FOR CDC 6500 (Fortran). OLYMPUS control and utility package for the CDC 6500. M.H. Hughes, K.V. Roberts, G.G. Lister. See other versions of this program ABUF, ABUJ. |

**Geophysics**

| *Vol.* | *Page* | *Cat.no.* | |
|---|---|---|---|
| 3 | 31 | AAEA | SHELL (Fortran). Direct computation of the magnetic shell parameter. G. Kluge. |
| 3 | 36 | AAEB | INTEL (Fortran). Numerical fits for the geomagnetic shell parameter. G. Kluge, K.G. Lenhart. Subroutine required by this program is AAEA. |
| 4 | 347 | AAEC | MAGNES (Fortran). Geomagnetic field models: scalar and vector potential, induction vector and its gradient tensor computed by a common algorithm. G. Kluge. |
| 10 | 421 | ACSG | H—PARALLEL FEMT—2D (Fortran). A finite element program package for magnetotelluric modelling. E. Kisak, P. Silvester. Subroutine required by this program is ACSJ. |
| 10 | 421 | ACSH | E—PARALLEL FEMT—2D (Fortran). A finite element program package for magnetotelluric modelling. E. Kisak, P. Silvester. Subroutine required by this program is ACSJ. |
| 10 | 421 | ACSJ | ZFORMATS (Fortran). A finite element program package for magnetotelluric modelling. E. Kisak, P. Silvester. |

**Laser Physics**

| *Vol.* | *Page* | *Cat.no.* | |
|---|---|---|---|
| 7 | 271 | ABUG | MEDUSA (Fortran). MEDUSA — a one—dimensional laser fusion code. J.P. Christiansen, D.E.T.F. Ashby, K.V. Roberts. Subroutine required by this program is ABUF. |
| 10 | 251 | ABUG | 000A CORRECTION 15/8/75 (Fortran). MEDUSA — a one—dimensional laser fusion code. J.P. Christiansen, D.E.T.F. Ashby, K.V. Roberts. |
| 10 | 117 | ACWD | TLASER (Fortran). TLASER — a CO2 laser kinetics code. A.R. Davies, K. Smith, R.M. Thomson. |
| 10 | 155 | ABUL | RAMSES (Fortran). RAMSES: a two—dimensional, PIC type laser pulse propagation code. H.D. Dudder, D.B. Henderson. Sūbroutine required by this program is ABUF. |

**Molecular Physics**
*Scattering*

| *Vol.* | *Page* | *Cat.no.* | |
|---|---|---|---|
| 1 | 380 | ACQQ | H+ + H(2) CHARGE TRANSFER (Fortran). Computation of charge transfer probability between protons and excited hydrogen atoms. V. Malaviya. |
| 1 | 445 | ACQO | ELECTRON—MOLECULE SCATTERING (Fortran). Electron scattering by closed shell diatomic molecules. A.L. Sinfailam. |
| 2 | 47 | ACQN | TRANSPORT COLLISION INTEGRALS (Fortran). Transport collision integrals for a dilute gas. H. O'Hara, F.J. Smith. |
| 2 | 173 | ACQN | 000A CORRECTION 10/03/71 (Fortran). Transport collision integrals for a dilute gas. H. O'Hara, F.J. Smith. |
| 3 | 269 | ACQN | 0001ACQN ADAPTED FOR IBM 360/75 (Fortran). Program ACQN to calculate transport collision integrals adapted to run on IBM computers. P.D. Neufeld, R.A. Aziz. |
| 2 | 114 | ACQT | EVAR (Fortran). Classical relative motion of 2 particles. D. Banks, I.C. Percival, J.McB. Wilson. See other version of this program ACRB. |
| 2 | 261 | ACQW | STATIC INTERACTION POTENTIAL (Fortran). A program for calculating the static interaction potential between an electron and a diatomic molecule. F.H.M. Faisal, A.L.V. Tench. |
| 5 | 396 | ACQW | 000A CORRECTION 19/12/72 (Fortran). A program for calculating the static interaction potential between an electron and a diatomic molecule. F.H.M. Faisal, A.L.V. Tench. |
| 3 | 1 | ABSA | SOUND ABSORPTION (Fortran). A program for the extraction of bulk viscosities from sound absorption data. H. Moraal. |
| 3 | 42 | AAGI | CLASSICAL TRAJECTORIES 324 (Algol). Trajectory calculations for the reaction K+HBr — KBr+H in the eV—region. A. van der Meulen. |
| 3 | 197 | ACRB | EVAR EDITION 02 (Fortran). Classical relative motion of 2 particles (EVAR edition 02). D. Banks, I.C. Percival, J.McB. Wilson. See other version of this program ACQT. |
| 3 | 221 | ACRC | EVA2 EDITION 01 (Fortran). Classical motion of 2 particles (EVA2 edition 01). D. Banks, I.C. Percival, J.McB. Wilson. Subroutine required by this program is ACRB. |

**Molecular Physics (cont.)**

*Scattering (cont.)*

| *Vol.* | *Page* | *Cat.no.* | |
|---|---|---|---|
| 5 | 239 | ACRH | ELECTRON ENERGY LOSS (Fortran). Electron energy deposition in a gaseous mixture. L.R. Peterson, T. Sawada, J.N. Bass, A.E.S. Green. |
| 5 | 417 | AAGO | SCAT (Fortran). A general program to study the scattering of particles by solving coupled inhomogeneous second—order differential equations. N. Chandra. Subroutine required by this program is ACRK. |
| 7 | 163 | ACRP | IPFVAIJ (Fortran). A programming package for the calculation of cross—sections and probabilities for charge—exchange processes. J. Van den Bos. |
| 7 | 163 | ACRQ | IPFDEQ (Fortran). A programming package for the calculation of cross—sections and probabilities for charge—exchange processes. J. Van den Bos. Subroutine required by this program is ACRP. |
| 10 | 223 | ACWJ | PAMPA (Fortran). Multistate molecular treatment of atomic collisions in the impact parameter approximation. I. Integration of coupled equations and calculation of transition amplitudes for the straight line case. C. Gaussorgues, R.D. Piacentini, A. Salin. |
| 10 | 375 | ACWI | VIBAD (Fortran). Rovibrational cross sections from reactance matrices calculated in adiabatic nuclei approximation. R.J.W. Henry. |

*Spectroscopy*

| *Vol.* | *Page* | *Cat.no.* | |
|---|---|---|---|
| 1 | 349 | AAGC | VIBROT I (Algol). I. Program for calculating degenerate Raman bands of symmetric tops with an adaptation for infrared bands. F.N. Masri, I.R. Williams. See other version of this program AAGF. |
| 1 | 350 | AAGC | 0001 ADAPT VIBROT I FOR INFRARED (Algol). I. Program for calculating degenerate Raman bands of symmetric tops with an adaptation for infrared bands. F.N. Masri, I.R. Williams. |
| 1 | 465 | ABKD | RITZ COMBINATION PRINCIPLE (Fortran). Program for fitting transition energies into a level scheme according to the combination principle. I.R. Williams. |
| 2 | 87 | AAGE | VIBROT II (Algol). II. Program for calculating triply degenerate Raman bands of spherical tops with an adaptation for infrared bands. F.N. Masri, I.R. Williams. See other version of this program AAGG. |
| 2 | 88 | AAGE | 0001ADAPT VIBROT II FOR INFRARED (Algol). II. Program for calculating triply degenerate Raman bands of spherical tops with an adaptation for infrared bands. F.N. Masri, I.R. Williams. |
| 2 | 288 | ABOF | DECAY SCHEME PROGRAM, DCSCH3 (Fortran). A program to aid in establishing gamma—ray decay schemes. B.P. Foster, D.C. Camp. |
| 2 | 289 | ABOG | DECAY SCHEME PROGRAM, DCSCH4 (Fortran). A program to aid in establishing gamma—ray decay schemes. B.P. Foster, D.C. Camp. |
| 2 | 298 | AAGF | FORTRAN VIBROT I (Fortran). I. A FORTRAN program for calculating degenerate Raman bands of symmetric tops with an adaptation for infrared bands. F.N. Masri, I.R. Williams. See other version of this program AAGC. |

**Molecular Physics (cont.)**

*Spectroscopy (cont.)*

| *Vol.* | *Page* | *Cat.no.* | |
|---|---|---|---|
| 2 | 298 | AAGF | 0001VIBROT I FOR INFRARED (Fortran). I. A FORTRAN program for calculating degenerate Raman bands of symmetric tops with an adaptation for infrared bands. F.N. Masri, I.R. Williams. |
| 2 | 299 | AAGG | FORTRAN VIBROT II (Fortran). II. A FORTRAN program for calculating degenerate Raman bands of spherical tops with, an adaptation for infrared bands. F.N. Masri, I.R. Williams. See other version of this program AAGE. |
| 2 | 299 | AAGG | 0001 VIBROT II FOR INFRARED (Fortran). II. A FORTRAN program for calculating degenerate Raman bands of spherical tops with an adaptation for infrared bands. F.N. Masri, I.R. Williams. |
| 8 | 236 | ACRW | ROSCOS (Algol). Analysis of the intensity distribution in the rotational structure of the electronic spectra of diatomic molecules by computer simulation. R.Ch. Baas, C.I.M. Beenakker. |
| 10 | 368 | ABWC | VIBOCO (Fortran). Vibrational energies of CO2. W.C. Maguire. |

*Structure*

| *Vol.* | *Page* | *Cat.no.* | |
|---|---|---|---|
| 1 | 21 | AACA | FRANCK--CONDON FACTOR PROGRAM (Fortran). A program to calculate Franck—Condon factors. A.C. Allison. |
| 1 | 223 | AACA | 000A CORRECTION 21/10/70 (Fortran). A program to calculate Franck—Condon factors. A.C. Allison. |
| 1 | 391 | ABYA | POLYMOL (Fortran). POLYMOL: a general program for the calculation of ground state wave functions for polymers. J.—M. Andre. |
| 4 | 257 | AAGM | MORSEFNS (Fortran). A program for normalised Morse functions. J.R. Parkinson, D.T. Birtwistle. |
| 6 | 221 | AAEE | RKRPOT (Fortran). A fast quadrature method for computing diatomic RKR potential curves. J. Tellinghuisen. |

**Nuclear Physics**

*Energy Loss*

| *Vol.* | *Page* | *Cat.no.* | |
|---|---|---|---|
| 2 | 433 | ABON | STRAGL (Fortran). Energy—loss straggling of heavy charged particles. R.G. Clarkson N. Jarmie. |
| 7 | 85 | ACIB | E—DEP—1 (Fortran). Depth distribution of energy deposition by ion bombardment. I. Manning, G.P. Mueller. |
| 7 | 185 | AAUK | MCS (Fortran). Monte Carlo simulation of photons in two—layered media for density gauges. E.R. Christensen. |
| 7 | 192 | AAUL | MCD (Fortran). Computer simulation of photons in spheric media for density gauges. E.R. Christensen. Subroutine required by this program is AAUK. |

**Nuclear Physics (cont.)**
*Energy Loss (cont.)*

| *Vol.* | *Page* | *Cat.no.* | |
|---|---|---|---|
| 7 | 215 | AAUI | LANDAU (Fortran). Programs for the Landau and the Vavilov distributions and the corresponding random numbers. B. Schorr. |
| 7 | 215 | AAUJ | VAVILOV (Fortran). Programs for the Landau and the Vavilov distributions and the corresponding random numbers. B. Schorr. |
| 7 | 327 | AAUH | FLUKA (Fortran). Monte Carlo programs for calculating three—dimensional high—energy (50 MeV—500GeV) hadron cascades in matter. J. Ranft, J.T. Routti. |
| 7 | 327 | AAUH | 0001TRANKA FOR DEEP PENETRATION (Fortran). Monte Carlo programs for calculating three—dimensional high—energy (50 MeV—500GeV) hadron cascades in matter. J. Ranft, J.T. Routti. |
| 7 | 344 | AAYF | CASCADE (Fortran). A program for the analytic simulation of extensive air showers. L. Goorevich. |
| 7 | 392 | AAUM | NELAS (Fortran). Nuclear energy loss and scattering of ions penetrating thin layers of matter. R. Skoog. |

*Experimental Analysis*

| *Vol.* | *Page* | *Cat.no.* | |
|---|---|---|---|
| 2 | 394 | ABCB | MATCH (Fortran). A track matching program for bubble chamber photographs. P.L. Bastien, J.N. Snyder, V. Pless. |
| 3 | 136 | AAUC | GAT (Fortran). A program for the generation of artificial bubble chamber events. J. Bettels, P. Dodd. |
| 5 | 56 | ABCF | COMBAT (Fortran). A program for closed orbit minimization by analytic technique. J.V. Trotman. |
| 5 | 163 | AAYB | OPTIME SYSTEM (Fortran). Users manual for the OPTIME system. P.H. Eberhard, W.O. Koellner. |
| 8 | 49 | ABCG | LINCOM (Fortran). Search program for significant variables. M.J. O'Connell. |
| 8 | 56 | ABCH | GSFIT (Fortran). Multivariate least squares fitting program using modified Gram—Schmidt transformations. M.J. O'Connell. |

*High Energy Scattering*

| *Vol.* | *Page* | *Cat.no.* | |
|---|---|---|---|
| 1 | 425 | AAUA | GENIS (Fortran). A Monte Carlo generation method with importance sampling for high energy collisions of hadrons. W. Kittel, L. Van Hove, W. Wojcik. |
| 2 | 207 | AAUB | RN (Fortran). The evaluation of the volume of the phase space of n particles. K. Kajantie, V. Karimaki. |
| 4 | 117 | AAUD | PERIPHERAL PHASE SPACE INTEGRAL (Fortran). Recursive numerical integration of multi—particle phase space with peripheral matrix element. P. Pirila, E. Byckling. |

**Nuclear Physics (cont.)**

*High Energy Scattering (cont.)*

| *Vol.* | *Page* | *Cat.no.* | |
|---|---|---|---|
| 5 | 153 | ABCE | EFFECTIVE REGGE TRAJECTORIES (Fortran). Computation of effective Regge trajectories for high energy two—body reactions. D.J. Harrison, A.C. Irving, A.D. Martin. |
| 5 | 217 | AAUE | LIMS (Algol). Approximation formula and ALGOL program of the Lorentz—invariant momentum—space integral for particles of equal masses. A. Jabs. |
| 5 | 349 | AAUF | EPWAAM (Fortran). An efficient partial—wave analyser for the absorption model. P.A. Collins, B.J. Hartley, R.W. Moore, K.J.M. Moriarty. |
| 7 | 327 | AAUH | FLUKA (Fortran). Monte Carlo programs for calculating three—dimensional high—energy (50 MeV—500GeV) hadron cascades in matter. J. Ranft, J.T. Routti. |
| 7 | 327 | AAUH | 0001TRANKA FOR DEEP PENETRATION (Fortran). Monte Carlo programs for calculating three—dimensional high—energy (50 MeV—500GeV) hadron cascades in matter. J. Ranft, J.T. Routti. |
| 7 | 344 | AAYF | CASCADE (Fortran). A program for the analytic simulation of extensive air showers. L. Goorevich. |
| 8 | 130 | ABCJ | PIRK (Fortran). PIRK: a computer program to calculate the elastic scattering of pions from nuclei. R.A. Eisenstein, G.A. Miller. |
| 9 | 182 | ABCK | DEM (Fortran). Monte Carlo simulation of the diffractive excitation model. J. Kasman. |
| 9 | 297 | AAUO | GENRAP (Fortran). Rapidity generator for Monte—Carlo calculations of cylindrical phase space. S. Jadach. |
| 9 | 360 | AAUP | ERRCAL (Fortran). A general purpose Monte—Carlo program. P. Dufour, J. Schlesinger. |

*Low Energy Scattering*

| *Vol.* | *Page* | *Cat.no.* | |
|---|---|---|---|
| 1 | 35 | ABOA | MANDY (Algol). Computation of total, differential, and double—differential cross sections for compound nuclear reactions of the type (a,b), (a,bgamma) and (a,bgamma—gamma) (II) Generalized programs MANDY and BARBARA for arbitrary angular momenta in Hauser—Feshbach—Moldauer formalism. E. Sheldon, R.M. Strang. See other versions of this program ABOJ, ABMF. |
| 2 | 278 | ABOA | 000A CORRECTION 23/04/71 (Algol). (See footnote CPC vol 2 page 278) computation of total, differential, and double—differential cross sections for compound nuclear reactions of the type (a,b), (a,bgamma) and (a,bgamma—gamma) (II) Generalized programs MANDY and BARBARA for arbitrary angular momenta in Hauser—Feshbach—Moldauer formalism. E. Sheldon, R.M. Strang. |
| 1 | 37 | ABOB | BARBARA (Algol). Computation of total, differential, and double—differential cross sections for compound nuclear reactions of the type (a,b), (a,bgamma) and (a,bgamma—gamma) (II) Generalized programs MANDY and BARBARA for arbitrary angular momenta in Hauser—Feshbach—Moldauer formalism. E. Sheldon, R.M. Strang. See other version of this program ABOK. |

**Nuclear Physics (cont.)**

*Low Energy Scattering (cont.)*

| *Vol.* | *Page* | *Cat.no.* | |
|---|---|---|---|
| 2 | 278 | ABOB | 000A CORRECTION 23/04/71 (Algol). (See footnote CPC vol 2 page 278) computation of total, differential, and double—differential cross sections for compound nuclear reactions of the type (a,b), (a,bgamma) and (a,bgamma—gamma) (II) Generalized programs MANDY and BARBARA for arbitrary angular momenta in Hauser—Feshbach—Moldauer formalism. E. Sheldon, R.M. Strang. |
| 1 | 55 | ACQA | BOUND (Fortran). Nuclear bound state wave function subroutine. W.R. Smith. |
| 1 | 97 | AAGA | REGGE TRAJECTORY (Fortran). A program for calculating Regge trajectories in potential scattering. P.G. Burke, C. Tate. |
| 1 | 106 | ACQF | SCAT (Fortran). Nuclear penetrability and phase shift subroutine. W.R. Smith. |
| 1 | 181 | ACQF | 0002 ADAPT SCAT TO LIANA (Fortran). Adaptation of subroutine SCAT for use with Program LIANA. W.R. Smith. |
| 1 | 198 | ACQF | 0001 ADAPT SCAT TO ELASTIC (Fortran). Adaptation of subroutine SCAT for use with Program ELASTIC. W.R. Smith. |
| 1 | 181 | ABKA | LIANA (Fortran). Hauser—Feshbach nuclear scattering subroutine LIANA. W.R. Smith. Subroutines required by this program are ACQF, ACQF0002. |
| 1 | 198 | ACQG | ELASTIC (Fortran). Nuclear elastic scattering program with parameter search. W.R. Smith. Subroutines required by this program are ABOD, ABOD0001, ACQF, ACQF0001. |
| 1 | 457 | ACQS | NUMERICAL ORBITAL FUNCTIONS (Fortran). A program to generate numerical orbital functions. W.D. Robb. See other version of this program AAHE. |
| 2 | 94 | ABOH | DWBA—VENUS (Fortran). Distorted wave Born approximation for nuclear reactions. T. Tamura, W.R. Coker, F. Rybicki. |
| 3 | 275 | ABOH | 000A CORRECTION 01/03/72 (Fortran). Distorted wave Born approximation for nuclear reactions. T. Tamura, W.R. Coker, F. Rybicki. |
| 2 | 223 | ABGB | PHASESHIFT ANALYSIS (Fortran). A program to calculate complex phase shifts and mixing parameters of elastic scattering of spin 1/2 particles on spin 1/2 targets. R. Kankowsky, D. Fick. |
| 2 | 272 | ABOJ | MANDYF (Fortran). Computation of total, differential and double—differential cross sections for compound nuclear reactions of the type (a,b), (a,bgamma) and (a,bgamma—gamma). (III) FORTRAN translations of the ALGOL programs MANDY and BARBARA. E. Sheldon, S. Mathur, D. Donati. See other versions of this program ABOA, ABMF. |
| 5 | 304 | ABOJ | 000A CORRECTION 17/10/72 (Fortran). Computation of total, differential and double—differential cross sections for compound nuclear reactions of the type (a,b), (a,bgamma) and (a,bgamma—gamma). (III) FORTRAN translations of the ALGOL programs MANDY and BARBARA. E. Sheldon, S. Mathur, D. Donati. |
| 2 | 274 | ABOK | BARBYF (Fortran). Computation of total, differential and double—differential cross sections for compound nuclear reactions of the type (a,b), (a,bgamma) and (a,bgamma—gamma). (III) FORTRAN translations of the ALGOL programs MANDY and BARBARA. E. Sheldon, S. Mathur, D. Donati. See other version of this program ABOB. |

**Nuclear Physics (cont.)**
*Low Energy Scattering (cont.)*

| *Vol.* | *Page* | *Cat.no.* | |
|---|---|---|---|
| 5 | 304 | ABOK | 000A CORRECTION 17/10/72 (Fortran). Computation of total, differential and double—differential cross sections for compound nuclear reactions of the type (a,b), (a,bgamma) and (a,bgamma—gamma). (III) FORTRAN translations of the ALGOL programs MANDY and BARBARA. E. Sheldon, S. Mathur, D. Donati. |
| 2 | 443 | ABOM | NUCLEAR SPECTRA (Fortran). Kinematical parameters of nuclear reactions. A. Wolfram, C.F. Moore, W.R. Coker. |
| 2 | 443 | AAAx | DATA FOR ABOM (Fortran). Kinematical parameters of nuclear reactions. A. Wolfram, C.F. Moore, W.R. Coker. |
| 2 | 455 | ABQC | ITER (Fortran). Calculation of electric quadrupole radial matrix elements for Coulomb excitation. M. Samuel, U. Smilansky. |
| 3 | 118 | ABQE | DXS1 (Fortran). Differential cross sections for electric quadrupole Coulomb excitation. S.M. Lea, V. Joshi, A.B. Lopez—Cepero. |
| 4 | 138 | ABGJ | EFFECTIVE RANGE APPROXIMATION (Fortran). The two—nucleon effective—range parameters with tensor forces. L. Lovitch, S. Rosati. Subroutines required by this program are ABGE, ABGE0001. |
| 4 | 227 | ABOS | TWOBDY (Fortran). Relativistic kinematics for two—body final states. W.J. Braithwaite. |
| 4 | 233 | ABOT | BODY3 (Fortran). Relativistic kinematics for three—body final states. W.J. Braithwaite. |
| 4 | 371 | ABGK | S 1/2 PARTICLE CS AND POL (Fortran). Computation of cross sections and polarizations for nuclear reactions, in which only spin 1/2 particles are involved. P. Heiss. |
| 5 | 69 | ABOU | OPTICS (Fortran). A nuclear optical model code for small computers. R.J. Eastgate W.J. Thompson, R.A. Hardekopf. See other version of this program ACRR. |
| 5 | 379 | AAGN | YUKAWA/RHxxLP D JL 72 (Fortran). Nearly exact calculation of the solution of the radial Schrodinger equation. L. Marquez. |
| 5 | 456 | ACRL | DCS (Fortran). Program for calculating differential and integral cross sections for quantum mechanical scattering problems from reactance or transition matrices. M.A. Brandt, D.G. Truhlar, R.L. Smith. |
| 7 | 172 | ACRL | 0001 ACRL ADAPTED FOR IBM360/370 (Fortran). Program ACRL to calculate differential and integral cross sections adapted to run on IBM computers. M.A. Brandt, D.G. Truhlar, R.L. Smith. |
| 6 | 99 | ABMF | CINDY (Fortran). Computation of total and differential cross sections for compound nuclear reactions of the type (a,a), (a,a'), (a,b), (a,gamma), (a,gamma—gamma), (a,bgamma) and (a,bgamma—gamma). (IV) Fortran program CINDY. E. Sheldon, V.C. Rogers. See other versions of this program ABOA, ABOJ. |
| 6 | 229 | ABGM | FATSO (Fortran). A program calculating the formulae for polarization effects in nuclear reactions. F. Seiler. |
| 7 | 13 | ABOW | FINITE RANGE DWBA PHASE 1 (Fortran). FORTRAN program to calculate finite—range no—recoil DWBA transfer cross sections. G.L. Payne, P.L. von Behren. |
| 7 | 13 | ABOX | FINITE RANGE DWBA PHASE 2 (Fortran). FORTRAN program to calculate finite—range no—recoil DWBA transfer cross sections. G.L. Payne, P.L. von Behren. Subroutine required by this program is ABOW. |

**Nuclear Physics (cont.)**

*Low Energy Scattering (cont.)*

| *Vol.* | *Page* | *Cat.no.* | |
|---|---|---|---|
| 7 | 343 | ACRR | OPTIX KSU1 (Fortran). A version of a nuclear optical model code for small computers designed to run on a PDP—15. S.K. Datta, W.J. Thompson, D.O. Elliott. See other version of this program ABOU. |
| 8 | 35 | ABOY | AROSA—FOR—COULOMB—EXCITATION—I (Fortran). Quantum mechanical coupled channels code for Coulomb excitation. F. Rosel, J.X. Saladin, K. Alder. Subroutine required by this program is ABOZ. |
| 8 | 35 | ABOZ | AROSA—FOR—COULOMB—EXCITATION—II (Fortran). Quantum mechanical coupled channels code for Coulomb excitation. F. Rosel, J.X. Saladin, K. Alder. Subroutine required by this program is ABOY. |
| 8 | 349 | ABPA | SATURN—1—FOR—EFR—DWBA (Fortran). Exact finite range DWBA calculations for heavy—ion induced nuclear reactions. T. Tamura, K.S. Low. Subroutine required by this program is ABPB. |
| 8 | 349 | ABPB | MARS—1—FOR—EFR—DWBA (Fortran). Exact finite range DWBA calculations for heavy—ion induced nuclear reactions. T. Tamura, K.S. Low. Subroutine required by this program is ABPA. |
| 8 | 396 | ABMJ | OSCI (Fortran). Bound—states of one nucleon in a Woods—Saxon well from a variational method. J.M. Delbrouck—Habaru, D.M. Dubois. |
| 9 | 11 | ABIC | COCHASE (Fortran). COCHASE, a code for coupled channel Schrodinger equations. S. Hirschi, E. Lomon, N. Spencer. |
| 9 | 92 | ABGO | PREEQ (Fortran). Program for spectra and cross—section calculations within the pre—equilibrium model of nuclear reactions. E. Betak. |
| 10 | 71 | ABGO | 000ACORRECTION 16/5/75 (Fortran). Program for spectra and cross—section calculations within the pre—equilibrium model of nuclear reactions. E. Betak. |
| 10 | 385 | ABMO | PAKINE3 (Fortran). Kinematics of three—body reactions. P.A. Assimakopoulos. |
| 10 | 385 | ABMP | PAKIPLOT (Fortran). Kinematics of three—body reactions. P.A. Assimakopoulos. |
| 10 | 401 | ABPD | PATIWEN (Fortran). PATIWEN — a code for Coulomb—nuclear interference calculations. D.H. Feng, A.R. Barnett. Subroutines required by this program are ABPC, ABPC0001. |

*Spectroscopy*

| *Vol.* | *Page* | *Cat.no.* | |
|---|---|---|---|
| 1 | 67 | ABQA | MOSSBAUER DATA LEAST—SQUARES FIT (Fortran). Versatile program for analysis of Mossbauer spectra. M.F. Bent, B.I. Persson, D.G. Agresti. |
| 1 | 465 | ABKD | RITZ COMBINATION PRINCIPLE (Fortran). Program for fitting transition energies into a level scheme according to the combination principle. I.R. Williams. |
| 2 | 33 | ABOE | ENERGY LEVELS IN DAVYDOV MODEL (Fortran). Energy level calculations in Davydov model. S.M. Abecasis, F.R. Femenia, E.S. Hernandez. |
| 2 | 40 | ABMB | NAA (Fortran). Computer—assisted analysis of gamma—ray spectra. G.D. Atkinson Jr., J.B. Whitworth, S.J. Gage. |
| 2 | 231 | ABGC | BRODY—MOSHINSKY BRACKETS (Fortran). Computation of Brody—Moshinsky brackets. A. Lejeune, J.P. Jeukenne. Subroutine required by this program is ABMA. |

**Nuclear Physics (cont.)**
*Spectroscopy (cont.)*

| *Vol.* | *Page* | *Cat.no.* | |
|---|---|---|---|
| 2 | 288 | ABOF | DECAY SCHEME PROGRAM, DCSCH3 (Fortran). A program to aid in establishing gamma—ray decay schemes. B.P. Foster, D.C. Camp. |
| 2 | 289 | ABOG | DECAY SCHEME PROGRAM, DCSCH4 (Fortran). A program to aid in establishing gamma—ray decay schemes. B.P. Foster, D.C. Camp. |
| 2 | 322 | ABIB | MOSSBAUER FITTING PROGRAM (Fortran). Computer analysis of Mossbauer spectra. B.L. Chrisman, T.A. Tumolillo. |
| 2 | 331 | ABQB | MIXING (Fortran). Electromagnetic M1 reduced transition probabilities for pure and mixed Nilsson states in odd—A nuclei. E. Browne, F.R. Femenia. |
| 2 | 427 | ABGF | INTERNAL CONVERSION COEFFICIENTS (Fortran). A program to calculate internal conversion coefficients for all atomic shells without screening. O. Dragoun, G. Heuser. |
| 3 | 53 | ABGH | OSCILLATOR BRACKETS (Fortran). Generalized transformation brackets for the harmonic oscillator functions. M. Sotona, M. Gmitro. |
| 3 | 61 | ABGG | TALMI (Fortran). A Fortran program for the computation of the generalized Talmi coefficients. O. Zohni. |
| 3 | 240 | AAGK | POSITRONFIT (Fortran). POSITRONFIT: a versatile program for analysing positron lifetime spectra. P. Kirkegaard, M. Eldrup. See other version of this program AAGX. |
| 3 | 339 | ABOP | MOSSBAUER SCATTERING SPECTRA (Fortran). Computer simulation of Mossbauer scattering spectra. J.L. Groves. |
| 5 | 225 | ABMD | PARAMAGNETIC MOSSBAUER SPECTRA (Fortran). Computer simulations of Mossbauer spectra for an effective spin S—1/2 Hamiltonian. E. Munck, J.L. Groves, T.A. Tumolillo, P.G. Debrunner. |
| 5 | 395 | ABMD | 000A CORRECTION 18/01/73 (Fortran). Computer simulations of Mossbauer spectra for an effective spin S—1/2 Hamiltonian. E. Munck, J.L. Groves, T.A. Tumolillo, P.G. Debrunner. |
| 7 | 151 | ACML | FLEXIBLE MOSSBAUER FIT ROUTINE (Fortran). A flexible least squares routine for general Mossbauer effect spectra fitting. W. Wilson, L.J. Swartzendruber. |
| 7 | 401 | AAGX | POSITRONFIT EXTENDED (Fortran). POSITRONFIT EXTENDED: a new version of a program for analysing positron lifetime spectra. P. Kirkegaard, M. Eldrup. See other version of this program AAGK. |
| 8 | 101 | ABGN | WSMCC (Fortran). Weizmann shell model computational code. R. Gross, Y. Accad. Subroutine required by this program is ABKB. |
| 8 | 199 | ABMI | MIA (Fortran). MIA, a FORTRAN—IV program for making spin and parity assignments to high—lying single and coherent twin nuclear levels from (alpha, nucleon) angular distributions in on—resonance, compound—nuclear, channel—spin—1/2 reactions. E. Sheldon, D.R. Donati, H.R. Hiddleston. |
| 9 | 117 | ABMK | LGFIT2 (Fortran). A least—squares spectral curve fitting routine for strongly overlapping lorentzians or gaussians. E.D. von Meerwall. |
| 9 | 351 | ABML | PEAK2 (Fortran). A FORTRAN code for automatic spectrum analysis on medium—scale computers. E.D. von Meerwall. |

**Nuclear Physics (cont.)**
*Spectroscopy (cont.)*

| *Vol.* | *Page* | *Cat.no.* | |
|---|---|---|---|
| 9 | 392 | ABGP | CATAR (Fortran). A computer program for internal conversion coefficients and particle parameters. H.C. Pauli, U. Raff. |
| 10 | 87 | ABPE | OSCILLATOR BRACKET (Fortran). Calculations of harmonic oscillator brackets. D.H. Feng, T. Tamura. |
| 10 | 145 | ABMM | SPEC3 (Fortran). A general—purpose routine for the analysis of spectroscopic peak shapes. E.D. von Meerwall. |

*Structure*

| *Vol.* | *Page* | *Cat.no.* | |
|---|---|---|---|
| 1 | 55 | ACQA | BOUND (Fortran). Nuclear bound state wave function subroutine. W.R. Smith. |
| 2 | 214 | ABIA | FOURBODY (Fortran). Rapid evaluation of four—body cluster contributions. G.P. Mueller. |
| 2 | 231 | ABGC | BRODY—MOSHINSKY BRACKETS (Fortran). Computation of Brody—Moshinsky brackets. A. Lejeune, J.P. Jeukenne. Subroutine required by this program is ABMA. |
| 2 | 353 | ABGE | DEUT (Fortran). Bound state solution of the two—nucleon Schroedinger equation with tensor forces. L. Lovitch, S. Rosati. |
| 4 | 140 | ABGE | 0001REMOVE NON—STANDARD FORTRAN (Fortran). Bound state solution of the two—nucleon Schroedinger equation with tensor forces. L. Lovitch, S. Rosati. |
| 3 | 22 | ABGD | HARFOCK (Fortran). Hartree—Fock nuclear calculations with gaussian potentials. J.F. Allard, A. Abzouzi, B. Houssais. |
| 3 | 53 | ABGH | OSCILLATOR BRACKETS (Fortran). Generalized transformation brackets for the harmonic oscillator functions. M. Sotona, M. Gmitro. |
| 3 | 61 | ABGG | TALMI (Fortran). A Fortran program for the computation of the generalized Talmi coefficients. O. Zohni. |
| 4 | 239 | ABGI | PROJ (Fortran). A nuclear Hartree—Fock intrinsic wavefunction projection program. J.F. Allard, N. Boumahrat, B. Houssais, M. Hadj Hassan, M. Lambert. |
| 4 | 262 | ABMC | AROVMI (Fortran). Energy level calculations with Arovmi model. S.M. Abecasis, F.R. Femenia. |
| 6 | 17 | ABGL | BSSW (Fortran). Computation of S—state binding energy and wave functions in a Saxon—Woods potential. J. Cugnon. |
| 6 | 30 | ABOV | NILSSON ORBITS (Fortran). Nilsson orbits for a particle in a Woods—Saxon potential with Y20 and Y40 deformations, and coupled to core rotational states. B. Hird. Subroutine required by this program is ABMA. |
| 7 | 145 | ABMG | EXTARO (Fortran). Energy—level calculations with the extended Arovmi model. S.M. Abecasis, F.R. Femenia. Subroutine required by this program is ABOE. |
| 10 | 87 | ABPE | OSCILLATOR BRACKET (Fortran). Calculations of harmonic oscillator brackets. D.H. Feng, T. Tamura. |
| 10 | 182 | ACWK | NUCLEAR POTENTIAL (Fortran). Solution of bound state problems in nuclear shell model with momentum dependent potentials. M.A.K. Lodhi, B.T. Waak. |

**Nuclear Physics (cont.)**
*Structure (cont.)*

| *Vol.* | *Page* | *Cat.no.* | |
|---|---|---|---|
| 10 | 293 | ABPF | DEFORMED QUASIPARTICLES (Fortran). Deformed quasiparticle states in a Woods—Saxon potential and coupled to rotational states of the core. B. Hird, K.H. Huang. Subroutine required by this program is ABMA. |

*Theoretical Methods (see also General Purpose)*

| *Vol.* | *Page* | *Cat.no.* | |
|---|---|---|---|
| 1 | 225 | ABKB | JJTCFP (Fortran). Coefficients of fractional parentage in j—j coupling in the isospin representation. L.B. Hubbard. |
| 1 | 453 | ABKC | JNTJN (Fortran). Allowed values of coupled angular momentum and i—spin for nucleons in a single shell in j—j coupling. L.B. Hubbard. |
| 2 | 420 | ABOL | 1PSHELL SU3 FRACTIONAL PARENTAGE (Fortran). SU3 fractional parentage in the 1p—shell. J. Meyer, R.S. Nahabetian, J. Joseph, J. Lafoucriere. |

**Optics**

| *Vol.* | *Page* | *Cat.no.* | |
|---|---|---|---|
| 6 | 187 | ACKD | KRKRAN (Fortran). Kramers — Kronig analysis of reflection data. R. Klucker, U. Nielsen. |
| 9 | 305 | ACWA | COLOUR COORDINATE CALCULATIONS (Fortran). Colour coordinate calculations. D.L. Bradly, R. Perrin. |
| 10 | 155 | ABUL | RAMSES (Fortran). RAMSES: a two—dimensional, PIC type laser pulse propagation code. H.D. Dudder, D.B. Henderson. Subroutine required by this program is ABUF. |

**Plasma Physics**

| *Vol.* | *Page* | *Cat.no.* | |
|---|---|---|---|
| 2 | 127 | ABUA | FOUR67 (Fortran). FOUR67, a fast Fourier transform package. J.P. Christiansen, R.W. Hockney. |
| 2 | 139 | ABUB | DELSQPHI (Fortran). DELSQPHI, a two—dimensional Poisson—solver program. J.P. Christiansen, R.W. Hockney. Subroutine required by this program is ABUA. |
| 2 | 157 | ABUC | DELSQRZ (Fortran). Solution of Poisson's equation in cylindrical coordinates. M.H. Hughes. Subroutine required by this program is ABUA. |
| 3 | 1 | ABSA | SOUND ABSORPTION (Fortran). A program for the extraction of bulk viscosities from sound absorption data. H. Moraal. |
| 3 | 322 | ABUD | SPARK71 (Fortran). The computation of the growth of a gaseous discharge in space—charge distorted fields. A.J. Davies, C.J. Evans. |
| 5 | 294 | ABUE | ABELA (Fortran). Calculation of the radial distribution of emitters in a cylindrical source. R. Piessens. |

**Plasma Physics (cont.)**

| *Vol.* | *Page* | *Cat.no.* | |
|---|---|---|---|
| 5 | 437 | ACSB | AXISYMM—SCALAR—HELMHOLTZ—FINTEL4 (Fortran). A finite element program package for axisymmetric scalar field problems. A. Konrad, P. Silvester. Subroutine required by this program is ACSD. See other version of this program ACSC. |
| 5 | 438 | ACSC | AXISYMM—SCALAR—HELMHOLTZ—FINTEL6 (Fortran). A finite element program package for axisymmetric scalar field problems. A. Konrad, P. Silvester. Subroutine required by this program is ACSD. See other version of this program ACSB. |
| 5 | 438 | ACSD | GENERATE (Fortran). A finite element program package for axisymmetric scalar field problems. A. Konrad, P. Silvester. |
| 7 | 200 | AAAC | ABEL (Fortran). Inversion of Abel's integral equation — application to plasma spectroscopy. C. Fleurier, J. Chapelle. |
| 7 | 271 | ABUG | MEDUSA (Fortran). MEDUSA — a one—dimensional laser fusion code. J.P. Christiansen, D.E.T.F. Ashby, K.V. Roberts. Subroutine required by this program is ABUF. |
| 10 | 251 | ABUG | 000A CORRECTION 15/8/75 (Fortran). MEDUSA — a one—dimensional laser fusion code. J.P. Christiansen, D.E.T.F. Ashby, K.V. Roberts. |
| 8 | 307 | ACRU | WATER BAG MODEL (Fortran). A numerical code for multiple water bag gravitational systems. S. Cuperman, A. Harten. |
| 9 | 193 | ACSE | AXISYMM—VECTOR—HELMHOLTZ—FINTEL6 (Fortran). A finite element program package for axisymmetric vector field problems. A. Konrad, P. Silvester. Subroutines required by this program are ACSC, ACSF. |
| 9 | 194 | ACSF | VECTR—FINTEL6—BLK—DATA—GENERATOR (Fortran). A finite element program package for axisymmetric vector field problems. A. Konrad, P. Silvester. |
| 10 | 11 | ACWB | THALIA (Fortran). THALIA — a one—dimensional magnetohydrodynamic stability program using the method of finite elements. K. Appert, D. Berger, R. Gruber, F. Troyon, K.V. Roberts. Subroutines required by this program are ABUK, ACWC. |
| 10 | 98 | ABSC | ABEL (Fortran). Inversion of Abel's integral equation by a direct method. L.S. Fan, W. Squire. |
| 10 | 155 | ABUL | RAMSES (Fortran). RAMSES: a two—dimensional, PIC type laser pulse propagation code. H.D. Dudder, D.B. Henderson. Subroutine required by this program is ABUF. |
| 10 | 194 | ABUM | MUCALC (Fortran). Determination of SSOR—SI iteration parameters. J.B. Campbell. |

**Quantum Chemistry**

| *Vol.* | *Page* | *Cat.no.* | |
|---|---|---|---|
| 1 | 391 | ABYA | POLYMOL (Fortran). POLYMOL: a general program for the calculation of ground state wave functions for polymers. J.—M. Andre. |
| 1 | 445 | ACQO | ELECTRON—MOLECULE SCATTERING (Fortran). Electron scattering by closed shell diatomic molecules. A.L. Sinfailam. |
| 2 | 201 | ACAA | DFZERO (Fortran). High speed evaluation of F0(x). L.L. Shipman, R.E. Christoffersen. |

**Quantum Chemistry (cont.)**

| *Vol.* | *Page* | *Cat.no.* | |
|---|---|---|---|
| 2 | 261 | ACQW | STATIC INTERACTION POTENTIAL (Fortran). A program for calculating the static interaction potential between an electron and a diatomic molecule. F.H.M. Faisal, A.L.V. Tench. |
| 5 | 396 | ACQW | 000A CORRECTION 19/12/72 (Fortran). A program for calculating the static interaction potential between an electron and a diatomic molecule. F.H.M. Faisal, A.L.V. Tench. |
| 3 | 130 | ABYB | FIELD (Fortran). Field and field gradient integrals based on gaussian type orbitals. O. Matsuoka. |
| 3 | 131 | ABYC | FGRAD (Fortran). Field and field gradient integrals based on gaussian type orbitals. O. Matsuoka. |
| 5 | 417 | AAGO | SCAT (Fortran). A general program to study the scattering of particles by solving coupled inhomogeneous second—order differential equations. N. Chandra. Subroutine required by this program is ACRK. |

**Radiation Physics**

| *Vol.* | *Page* | *Cat.no.* | |
|---|---|---|---|
| 1 | 440 | ACQR | SYNCHROTRON RADIATION (Fortran). Spectral intensity, angular distribution and polarisation of synchrotron radiation from a monoenergetic electron. J. Lang. |
| 2 | 433 | ABON | STRAGL (Fortran). Energy—loss straggling of heavy charged particles. R.G. Clarkson, N. Jarmie. |
| 2 | 449 | ACMG | DOSEI (Fortran). Gamma—radiation dosimetry for arbitrary source and target geometry. L.B. Hubbard. |
| 5 | 395 | ACMG | 000A CORRECTION 05/03/73 (Fortran). Gamma—radiation dosimetry for arbitrary source and target geometry. L.B. Hubbard. |
| 6 | 240 | ACMG | 0001 DOSEI IMPROVEMENTS (Fortran). First collision gamma—ray dose. L.B. Hubbard. |
| 5 | 239 | ACRH | ELECTRON ENERGY LOSS (Fortran). Electron energy deposition in a gaseous mixture. L.R. Peterson, T. Sawada, J.N. Bass, A.E.S. Green. |
| 6 | 187 | ACKD | KRKRAN (Fortran). Kramers — Kronig analysis of reflection data. R. Klucker, U. Nielsen. |
| 7 | 85 | ACIB | E—DEP—1 (Fortran). Depth distribution of energy deposition by ion bombardment. I. Manning, G.P. Mueller. |
| 7 | 185 | AAUK | MCS (Fortran). Monte Carlo simulation of photons in two—layered media for density gauges. E.R. Christensen. |
| 7 | 192 | AAUL | MCD (Fortran). Computer simulation of photons in spheric media for density gauges. E.R. Christensen. Subroutine required by this program is AAUK. |
| 7 | 215 | AAUI | LANDAU (Fortran). Programs for the Landau and the Vavilov distributions and the corresponding random numbers. B. Schorr. |
| 7 | 215 | AAUJ | VAVILOV (Fortran). Programs for the Landau and the Vavilov distributions and the corresponding random numbers. B. Schorr. |
| 7 | 327 | AAUH | FLUKA (Fortran). Monte Carlo programs for calculating three—dimensional high—energy (50 MeV—500GeV) hadron cascades in matter. J. Ranft, J.T. Routti. |

**Radiation Physics (cont.)**

| *Vol.* | *Page* | *Cat.no.* | |
|---|---|---|---|
| 7 | 327 | AAUH | 0001TRANKA FOR DEEP PENETRATION (Fortran). Monte Carlo programs for calculating three—dimensional high—energy (50 MeV—500GeV) hadron cascades in matter. J. Ranft, J.T. Routti. |
| 7 | 344 | AAYF | CASCADE (Fortran). A program for the analytic simulation of extensive air showers. L. Goorevich. |
| 7 | 392 | AAUM | NELAS (Fortran). Nuclear energy loss and scattering of ions penetrating thin layers of matter. R. Skoog. |

**Radiative Transfer**

| *Vol.* | *Page* | *Cat.no.* | |
|---|---|---|---|
| 5 | 294 | ABUE | ABELA (Fortran). Calculation of the radial distribution of emitters in a cylindrical source. R. Piessens. |
| 6 | 38 | AAAB | TRANSPHERE (Fortran). Numerical evaluation of the formal solution of radiative transfer problems in spherical geometries. D.G. Hummer, C.V. Kunasz, P.B. Kunasz. |
| 10 | 304 | AAAH | SLAB3 (Fortran). Transfer of line radiation in optically thick media allowing for transport of excitation energy: the resonant doublet. C.V. Kunasz, P.B. Kunasz. |

**Solid State Physics**
*Electronic Properties*

| *Vol.* | *Page* | *Cat.no.* | |
|---|---|---|---|
| 1 | 281 | ACMA | NA CL MADELUNG FIELD (Fortran). The Madelung potential and electric field intensity for a sodium chloride and for a caesium chloride lattice. U. Opik, R.F. Wood. |
| 1 | 282 | ACMB | CS CL MADELUNG FIELD (Fortran). The Madelung potential and electric field intensity for a sodium chloride and for a caesium chloride lattice. U. Opik, R.F. Wood. |
| 1 | 440 | ACQR | SYNCHROTRON RADIATION (Fortran). Spectral intensity, angular distribution and polarisation of synchrotron radiation from a monoenergetic electron. J. Lang. |
| 2 | 11 | ACMD | SYMMETRY AND BAND STRUCTURE 1 (Fortran). Selection of reciprocal lattice vectors. V. Hoffstein, O. Moller. |
| 2 | 17 | ACME | SYMMETRY AND BAND STRUCTURE 2 (Fortran). Storage and retrieval of group theoretical information. V. Hoffstein, O. Moller. |
| 2 | 26 | ACMF | SYMMETRY AND BAND STRUCTURE 3 (Fortran). Construction of symmetrized Hamiltonian matrix. V. Hoffstein, O. Moller. Subroutine required by this program is ACME. |
| 2 | 191 | ACAB | CRYSTAL FIELD AND G VALUE (Fortran). Lanthanide crystal field fitting routine. G.E. Stedman. |
| 2 | 341 | ACMH | LEED (Fortran). Program for calculating LEED intensities using band structure—matching formalism. V. Hoffstein. |

**Solid State Physics (cont.)**

*Electronic Properties (cont.)*

| *Vol.* | *Page* | *Cat.no.* | |
|---|---|---|---|
| 3 | 334 | ACQZ | SCHROD (Fortran). Numerical solution of the radial Schrodinger equation. F. Beleznay. |
| 4 | 361 | ACMJ | SYMMETRIZED APW (Fortran). Symmetrized program for calculating energy bands and electronic structure of solids. V. Hoffstein, D.K. Ray, M. Belakhovsky. |
| 10 | 67 | ACMJ | 0001 SYMMETRY AND BANDSTRUCTURE (Fortran). Symmetry and bandstructure. J.Th.M. de Hosson. |
| 5 | 299 | ACKC | MUKUL (Fortran). A routine for calculating the form—factor and the electrical resistivity of liquid N.F.E. metals. Md.M. Islam. |
| 5 | 430 | ACIA | ELECTROTRANSPORT SIMULATION (Fortran). Simulation of chemical profiles during electrotransport. D.L. Olson, J.L. Blough, T.S. Lakshmanan, D.A. Rigney. |
| 7 | 50 | ACMK | ICMLEED—MATRIX INVERSION (Fortran). Program for calculating LEED intensities based on the inelastic collision model: I. Matrix inversion method. V. Hoffstein. |
| 7 | 207 | ACID | CRYSTAL POTENTIALS (Fortran). Calculation of crystal potentials. D.A. Papaconstantopoulos, W.R. Slaughter. |
| 7 | 369 | ACKE | LEED BY LAYERS AND PERTURBATION (Fortran). LEED intensity curves by the layer—by—layer method and perturbation calculation. J. Rundgren, A. Salwen. See other version of this program ACKG. |
| 7 | 419 | ACKF | WORK (Fortran). Program for calculating work functions from photoelectric data. I.F. Kerr, C.H.B. Mee. |
| 9 | 312 | ACKG | LEED BEAM—SYMMETRIZED (Fortran). Symmetrization and calculation of LEED intensity patterns. J. Rundgren, A. Salwen. See other version of this program ACKE. |

*Mossbauer Effect*

| *Vol.* | *Page* | *Cat.no.* | |
|---|---|---|---|
| 1 | 67 | ABQA | MOSSBAUER DATA LEAST—SQUARES FIT (Fortran). Versatile program for analysis of Mossbauer spectra. M.F. Bent, B.I. Persson, D.G. Agresti. |
| 2 | 322 | ABIB | MOSSBAUER FITTING PROGRAM (Fortran). Computer analysis of Mossbauer spectra. B.L. Chrisman, T.A. Tumolillo. |
| 3 | 339 | ABOP | MOSSBAUER SCATTERING SPECTRA (Fortran). Computer simulation of Mossbauer scattering spectra. J.L. Groves. |
| 5 | 225 | ABMD | PARAMAGNETIC MOSSBAUER SPECTRA (Fortran). Computer simulations of Mossbauer spectra for an effective spin S—1/2 Hamiltonian. E. Munck, J.L. Groves, T.A. Tumolillo, P.G. Debrunner. |
| 5 | 395 | ABMD | 000A CORRECTION 18/01/73 (Fortran). Computer simulations of Mossbauer spectra for an effective spin S—1/2 Hamiltonian. E. Munck, J.L. Groves, T.A. Tumolillo, P.G. Debrunner. |
| 7 | 151 | ACML | FLEXIBLE MOSSBAUER FIT ROUTINE (Fortran). A flexible least squares routine for general Mossbauer effect spectra fitting. W. Wilson, L.J. Swartzendruber. |
| 9 | 117 | ABMK | LGFIT2 (Fortran). A least—squares spectral curve fitting routine for strongly overlapping lorentzians or gaussians. E.D. von Meerwall. |

**Solid State Physics (cont.)**

*Other Solid State Physics*

| *Vol.* | *Page* | *Cat.no.* | |
|---|---|---|---|
| 1 | 10 | ACKA | GINZBURG—LANDAU—FLUXOIDS (Algol). Ginzburg—Landau fluxoids. U. Kammerer. |
| 1 | 281 | ACMA | NA CL MADELUNG FIELD (Fortran). The Madelung potential and electric field intensity for a sodium chloride and for a caesium chloride lattice. U. Opik, R.F. Wood. |
| 1 | 282 | ACMB | CS CL MADELUNG FIELD (Fortran). The Madelung potential and electric field intensity for a sodium chloride and for a caesium chloride lattice. U. Opik, R.F. Wood. |
| 1 | 343 | ACKB | SYMMETRIC NEEL WALLS (Algol). Symmetric Neel walls in thin magnetic films. A. Hubert. |
| 1 | 468 | ACKB | 0001 INTERNAL IMPROVEMENTS (Algol). Symmetric Neel walls in thin magnetic films. An adaptation to increase the range of convergence. A. Hubert. |
| 1 | 440 | ACQR | SYNCHROTRON RADIATION (Fortran). Spectral intensity, angular distribution and polarisation of synchrotron radiation from a monoenergetic electron. J. Lang. |
| 2 | 301 | ACQY | GRAINS (Fortran). Computer simulation of extended defects in metals. R.E. Dahl Jr., J.R. Beeler Jr., R.D. Bourquin. |
| 3 | 88 | ACMI | GROUP THEORY OF LATTICE DYNAMICS (Fortran). Group—theoretical analysis of lattice vibrations. T.G. Worlton, J.L. Warren. See other version of this program ACMM. |
| 4 | 249 | ACMI | 0001 EXTERNAL MODES (Fortran). External modes of molecular crystals. T.G. Worlton. |
| 6 | 149 | ACMI | 0002 IMR CALCULATION (Fortran). Irreducible multiplier representations. T.G. Worlton. |
| 8 | 141 | ACMI | B00ACORRECTION TO 0002 04/08/74 (Fortran). Irreducible multiplier representations. T.G. Worlton. |
| 5 | 430 | ACIA | ELECTROTRANSPORT SIMULATION (Fortran). Simulation of chemical profiles during electrotransport. D.L. Olson, J.L. Blough, T.S. Lakshmanan, D.A. Rigney. |
| 6 | 187 | ACKD | KRKRAN (Fortran). Kramers — Kronig analysis of reflection data. R. Klucker, U. Nielsen. |
| 7 | 85 | ACIB | E—DEP—1 (Fortran). Depth distribution of energy deposition by ion bombardment. I. Manning, G.P. Mueller. |
| 7 | 289 | ACIC | SLOW NEUTRON MULTIPLE SCATTERING (Fortran). Monte Carlo calculation of multiple scattering effects in thermal neutron scattering experiments. J.R.D. Copley. |
| 9 | 59 | ACIC | 0001 SLAB GEOMETRY (Fortran). Monte Carlo calculation of multiple scattering effects in thermal neutron scattering experiments; modification to slab geometry. J.R.D. Copley. |
| 9 | 64 | ACIC | 0002HORIZONTAL CYLINDER GEOMETRY (Fortran). Monte Carlo calculation of multiple scattering effects in thermal neutron scattering experiments; modification to horizontal cylinder geometry. J.R.D. Copley. |
| 8 | 71 | ACMM | GROUP THEORY LATTICE DYNAMICS 2 (Fortran). Improved version of group—theoretical analysis of lattice dynamics. J.L. Warren, T.G. Worlton. See other version of this program ACMI. |

**Solid State Physics (cont.)**
*Other Solid State Physics (cont.)*

| *Vol.* | *Page* | *Cat.no.* | |
|---|---|---|---|
| 9 | 173 | ACKH | ASYMMETRY PARAMETER IN NQR (Fortran). Exact computation of the Zeeman effect on nuclear quadrupole resonance profiles for powders (spin I — 3/2). Determination of the asymmetry parameter. J. Darville, A. Gerard. |

*Symmetry and Group Properties*

| *Vol.* | *Page* | *Cat.no.* | |
|---|---|---|---|
| 2 | 11 | ACMD | SYMMETRY AND BAND STRUCTURE 1 (Fortran). Selection of reciprocal lattice vectors. V. Hoffstein, O. Moller. |
| 2 | 17 | ACME | SYMMETRY AND BAND STRUCTURE 2 (Fortran). Storage and retrieval of group theoretical information. V. Hoffstein, O. Moller. |
| 2 | 26 | ACMF | SYMMETRY AND BAND STRUCTURE 3 (Fortran). Construction of symmetrized Hamiltonian matrix. V. Hoffstein, O. Moller. Subroutine required by this program is ACME. |
| 3 | 88 | ACMI | GROUP THEORY OF LATTICE DYNAMICS (Fortran). Group—theoretical analysis of lattice vibrations. T.G. Worlton, J.L. Warren. See other version of this program ACMM. |
| 4 | 249 | ACMI | 0001 EXTERNAL MODES (Fortran). External modes of molecular crystals. T.G. Worlton. |
| 6 | 149 | ACMI | 0002 IMR CALCULATION (Fortran). Irreducible multiplier representations. T.G. Worlton. |
| 8 | 141 | ACMI | B00ACORRECTION TO 0002 04/08/74 (Fortran). Irreducible multiplier representations. T.G. Worlton. |
| 4 | 361 | ACMJ | SYMMETRIZED APW (Fortran). Symmetrized program for calculating energy bands and electronic structure of solids. V. Hoffstein, D.K. Ray, M. Belakhovsky. |
| 10 | 67 | ACMJ | 0001 SYMMETRY AND BANDSTRUCTURE (Fortran). Symmetry and bandstructure. J.Th.M. de Hosson. |
| 8 | 71 | ACMM | GROUP THEORY LATTICE DYNAMICS 2 (Fortran). Improved version of group—theoretical analysis of lattice dynamics. J.L. Warren, T.G. Worlton. See other version of this program ACMI. |
| 9 | 231 | ACUA | SPACE GROUP REPRESENTATIONS (Fortran). Numerical calculations of the irreducible representations of space groups. N. Neto. |
| 10 | 104 | ACKJ | NORMAL COORDINATE ANALYSIS (Fortran). Normal coordinate analysis of crystals. J.Th.M. de Hosson. |

Computer Physics Communications (1976)
© North-Holland Publishing Company

# AUTHOR INDEX TO VOLUMES 1–10


| *Vol.* | *Page* | | |
|---|---|---|---|
| 9 | 327 | J. Abdallah Jr. | Continuum exchange integrals for algebraic variational calculations of electron—atom scattering using Slater—type orbitals as basis functions. |
| 2 | 33 | S.M. Abecasis | Energy level calculations in Davydov model. |
| 4 | 262 | S.M. Abecasis | Energy level calculations with Arovmi model. |
| 7 | 145 | S.M. Abecasis | Energy—level calculations with the extended Arovmi model. |
| 3 | 22 | A. Abzouzi | Hartree—Fock nuclear calculations with gaussian potentials. |
| 8 | 101 | Y. Accad | Weizmann shell model computational code. |
| 1 | 67 | D.G. Agresti | Versatile program for analysis of Mossbauer spectra. |
| 3s | 166 | P. Aigrain | Computing and scientific research in Europe. |
| 5 | 405 | Y. Akiyama | A user's guide to Fortran programs for Wigner and Racah coefficients of SU3. |
| 4 | 275 | F. Akolk | DESY on—line system. |
| 3s | 86 | B.J. Alder | Numerical experiments in statistical mechanics. |
| 8 | 35 | K. Alder | Quantum mechanical coupled channels code for Coulomb excitation. |
| 3 | 22 | J.F. Allard | Hartree—Fock nuclear calculations with gaussian potentials. |
| 4 | 239 | J.F. Allard | A nuclear Hartree—Fock intrinsic wavefunction projection program. |
| 1 | 21 | A.C. Allison | A program to calculate Franck—Condon factors. |
| 1 | 223 | A.C. Allison | Erratum notice. A program to calculate Franck—Condon factors. |
| 3 | 173 | A.C. Allison | The calculation of absorption and elastic cross sections using the optical potential. |
| 1 | 15 | D.C.S. Allison | Fractional parentage coefficients for equivalent p shell and equivalent d shell electrons. |
| 3 | 273 | D.C.S. Allison | Book review. |
| 8 | 246 | D.C.S. Allison | Fractional parentage coefficients for equivalent f shell electrons. |
| 9 | 85 | J. Anderson | A plotting package for visual comparison of points and curves. |
| 1 | 391 | J.—M. Andre | POLYMOL: a general program for the calculation of ground state wave functions for polymers. |
| 10 | 11 | K. Appert | THALIA — a one—dimensional magnetohydrodynamic stability program using the method of finite elements. |
| 10 | 203 | R.J. Ascuitto | Systems aspects of large scale nuclear science programming. |
| 7 | 271 | D.E.T.F. Ashby | MEDUSA — a one—dimensional laser fusion code. |
| 10 | 251 | D.E.T.F. Ashby | Erratum notice. MEDUSA — a one—dimensional laser fusion code. |
| 10 | 385 | P.A. Assimakopoulos | Kinematics of three—body reactions. |
| 2 | 40 | G.D. Atkinson Jr. | Computer—assisted analysis of gamma—ray spectra. |

| *Vol.* | *Page* | | |
|---|---|---|---|
| 4 | 20 | A. Attanasio | Numerical solution of the eigenvalue problem of infinite matrices in molecular dynamics. |
| 4 | 27 | A.M. Aurela | Some physical applications of the solution of ill—conditioned systems of linear equations. |
| 10 | 203 | E.E. Ayoub | Systems aspects of large scale nuclear science programming. |
| 3 | 269 | R.A. Aziz | Program ACQN to calculate transport collision integrals adapted to run on IBM computers. |
| 8 | 236 | R.Ch. Baas | Analysis of the intensity distribution in the rotational structure of the electronic spectra of diatomic molecules by computer simulation. |
| 4 | 208 | H.P. Baltes | Progress in Weyl's problem achieved by computational methods. |
| 2 | 114 | D. Banks | Classical relative motion of 2 particles. |
| 3 | 180 | D. Banks | Stirling FORDOC 01. A set of documentation conventions for FORTRAN packages and routines. |
| 3 | 197 | D. Banks | Classical relative motion of 2 particles (EVAR edition 02). |
| 3 | 221 | D. Banks | Classical motion of 2 particles (EVA2 edition 01). |
| 3 | 73 | C. Bardin | Coulomb functions in entire (eta,rho)—plane. |
| 8 | 377 | A.R. Barnett | Coulomb wave functions for all real eta and rho. |
| 10 | 401 | A.R. Barnett | PATIWEN — a code for Coulomb—nuclear interference calculations. |
| 5 | 239 | J.N. Bass | Electron energy deposition in a gaseous mixture. |
| 1 | 415 | P. Basso | An algorithm generating permutations with identical objects. |
| 2 | 394 | P.L. Bastien | A track matching program for bubble chamber photographs. |
| 8 | 220 | G.N. Bates | A fixed core Hartree—Fock program for calculating bound and continuum orbitals. |
| 4 | 20 | A. Bauder | Numerical solution of the eigenvalue problem of infinite matrices in molecular dynamics. |
| 1 | 113 | D.R. Beck | Relativistic and non—relativistic configuration interaction calculations for atoms having a closed core and two valence spin—orbitals. |
| 3 | 155 | R.E. Beck | Computer generated Weyl groups. |
| 6 | 24 | R.E. Beck | Freudenthal's inner multiplicity formula. |
| 8 | 95 | R.E. Beck | Racah's outer multiplicity formula. |
| 9 | 85 | R.C. Beckwith | A plotting package for visual comparison of points and curves. |
| 2 | 301 | J.R. Beeler Jr. | Computer simulation of extended defects in metals. |
| 6 | 63 | J.R. Beeler Jr. | Book review. |
| 8 | 236 | C.I.M. Beenakker | Analysis of the intensity distribution in the rotational structure of the electronic spectra of diatomic molecules by computer simulation. |
| 4 | 1 | M. Beiner | Direct numerical integration of coupled one—dimensional Schrodinger equations. |
| 4 | 361 | M. Belakhovsky | Symmetrized program for calculating energy bands and electronic structure of solids. |
| 3 | 334 | F. Beleznay | Numerical solution of the radial Schrodinger equation. |
| 1 | 67 | M.F. Bent | Versatile program for analysis of Mossbauer spectra. |

| *Vol.* | *Page* | | |
|---|---|---|---|
| 10 | 11 | D. Berger | THALIA — a one—dimensional magnetohydrodynamic stability program using the method of finite elements. |
| 7 | 63 | J. Bernussou | Computation of area preserving mappings. |
| 8 | 149 | K.A. Berrington | A general program to calculate atomic continuum processes using the R—matrix method. |
| 9 | 92 | E. Betak | Program for spectra and cross—section calculations within the pre—equilibrium model of nuclear reactions. |
| 10 | 71 | E. Betak | Erratum notice. Program for spectra and cross—section calculations within the pre—equilibrium model of nuclear reactions. |
| 3 | 136 | J. Bettels | A program for the generation of artificial bubble chamber events. |
| 4 | 299 | G.F. Bignami | A method for the automatic analysis of gamma ray events in astronomical spark chambers. |
| 4 | 257 | D.T. Birtwistle | A program for normalised Morse functions. |
| 10 | 259 | D. Biskamp | European Physical Society Computational Physics Group. |
| 5 | 430 | J.L. Blough | Simulation of chemical profiles during electrotransport. |
| 4 | 64 | R.M. Blowers | The computation of two—dimensional viscous flow through a T—junction. |
| 5 | 400 | R.K. Bock | Software concepts for large application programs. |
| 9 | 221 | R.K. Bock | Program portability in high—energy physics. |
| 7 | 73 | M. Boring | A non—relativistic SCF atomic program to compute one—electron energies, total energies, and Slater integrals. |
| 10 | 434 | M. Boring | Erratum notice. A non—relativistic SCF atomic program to compute one—electron energies, total energies and Slater integrals. |
| 4 | 89 | J.P. Boujot | Numerical simulation of the evolution of a plasma in a confinement device. |
| 4 | 239 | N. Boumahrat | A nuclear Hartree—Fock intrinsic wavefunction projection program. |
| 2 | 301 | R.D. Bourquin | Computer simulation of extended defects in metals. |
| 1 | 415 | C. Bourrely | An algorithm generating permutations with identical objects. |
| 4 | 345 | P. Bouvier | Numerical experiments concerning isolated and non—isolated stellar systems. |
| 9 | 305 | D.L. Bradly | Colour coordinate calculations. |
| 5 | 123 | D.F. Brailsford | The OPIT system. I. A file—handling scheme for data in large applications programs. |
| 5 | 136 | D.F. Brailsford | The OPIT system. II. Job control and scheduling for large applications programs. |
| 3 | 318 | W.J. Braithwaite | The reduced rotation matrix. |
| 4 | 227 | W.J. Braithwaite | Relativistic kinematics for two—body final states. |
| 4 | 233 | W.J. Braithwaite | Relativistic kinematics for three—body final states. |
| 5 | 390 | W.J. Braithwaite | Associated Legendre polynomials, ordinary and modified spherical harmonics. |
| 5 | 456 | M.A. Brandt | Program for calculating differential and integral cross sections for quantum mechanical scattering problems from reactance or transition matrices. |

| *Vol.* | *Page* | | |
|---|---|---|---|
| 7 | 172 | M.A. Brandt | Program ACRL to calculate differential and integral cross sections adapted to run on IBM computers. |
| 7 | 177 | M.A. Brandt | Erratum. Program for calculating differential and integral cross sections for quantum mechanical scattering problems from reactance or transition matrices. |
| 9 | 205 | S. Brandt | Computer—drawn trajectories of particles in mutual and external fields — an application of computers in university physics teaching. |
| 4 | 384 | B.H. Bransden | Book review. |
| 5 | 98 | B.H. Bransden | The Durham elementary particle data bank, data analysis and model comparison project. |
| 9 | 258 | M. Brocklehurst | Computation of line and continuum radiation from thermal radioastronomical sources. |
| 4 | 315 | K. Brokate | Recognition of bubble chamber events exemplified by the Heidelberg automatic system. |
| 10 | 203 | D.A. Bromley | Systems aspects of large scale nuclear science programming. |
| 2 | 331 | E. Browne | Electromagnetic M1 reduced transition probabilities for pure and mixed Nilsson states in odd—A nuclei. |
| 1 | v | P.G. Burke | Introduction. |
| 1 | 97 | P.G. Burke | A program for calculating Regge trajectories in potential scattering. |
| 1 | 141 | P.G. Burke | Editorial: Program annotation. |
| 1 | 241 | P.G. Burke | A program to calculate a general recoupling coefficient. |
| 1 | 306 | P.G. Burke | A computer program for the calculation of electron scattering and photoionization cross sections of atomic systems with configuration (np)q. |
| 1 | 379 | P.G. Burke | Editorial. |
| 1 | 470 | P.G. Burke | Erratum. A computer program for the calculation of electron scattering and photoionization cross sections of atomic systems with configuration (np)q. |
| 2 | 173 | P.G. Burke | Erratum notice. A program to calculate a general recoupling coefficient. |
| 3 | 272 | P.G. Burke | Book review. |
| 3s | 1 | P.G. Burke | The impact of computers on atomic physics. |
| 4 | v | P.G. Burke | Editorial. |
| 6 | 288 | P.G. Burke | The R—matrix method in atomic physics. |
| 8 | iii | P.G. Burke | Editorial. |
| 8 | 149 | P.G. Burke | A general program to calculate atomic continuum processes using the R—matrix method. |
| 1 | 64 | V.M. Burke | The Program Library and how to become a subscriber. |
| 1 | 473 | V.M. Burke | The C.P.C. Program Library. |
| 4 | 117 | E. Byckling | Recursive numerical integration of multi—particle phase space with peripheral matrix element. |

| *Vol.* | *Page* | | |
|---|---|---|---|
| 7 | 69 | R. Calinon | Numerical determination of the critical point in the 3—D Ising model in Wilson's formalism. |
| 6 | 265 | J. Callaway | Polarized orbital methods. |
| 4 | 199 | J. Calmet | A REDUCE approach to the calculation of Feynman diagrams. |
| 3 | 273 | I.G. Cameron | Book review. |
| 2 | 288 | D.C. Camp | Programs to aid in establishing gamma—ray decay schemes, DCSCH3 and DCSCH4. |
| 1 | 251 | J.A. Campbell | LISP and its applications to physical problems. |
| 9 | 283 | J.B. Campbell | A program package for the Dirichlet problem with axially symmetric boundary conditions. |
| 10 | 194 | J.B. Campbell | Determination of SSOR—SI iteration parameters. |
| 1 | 293 | M. Canut—Amoros | STLPLT—CALCOMP plot of crystallographic projections of Laue photographs. |
| 5 | 365 | J.M. Casilio | Analytic formulation of SU(3) vector coupling coefficients for n particles. |
| 3s | 174 | H.B.G. Casimir | Impact of computers on industrial research and development. |
| 8 | i | H.B.G. Casimir | Announcement. |
| 5 | 98 | B. Chadwick | The Durham elementary particle data bank, data analysis and model comparison project. |
| 9 | 131 | J.M.F. Chamayou | On the approximate solution of the delay integral equation of the statistical theory of radiation damage. |
| 10 | 282 | J.M.F. Chamayou | Bicubic spline function approximation of the solution of the fast neutron transport equation. |
| 5 | 417 | N. Chandra | A general program to study the scattering of particles by solving coupled inhomogeneous second—order differential equations. |
| 7 | 225 | J.J. Chang | A program to evaluate the reduced matrix elements of one particle tensor operators for the configurations in jj—coupling. |
| 8 | 149 | J.J. Chang | A general program to calculate atomic continuum processes using the R—matrix method. |
| 7 | 200 | J. Chapelle | Inversion of Abel's integral equation — application to plasma spectroscopy. |
| 3s | 117 | J.G. Charney | Impact of computers on meteorology. |
| 6 | 336 | J.C.Y. Chen | Faddeev—type coupled equations. |
| 5 | 11 | B.V. Chirikov | Numerical experiments on the statistical behaviour of dynamical systems with a few degrees of freedom. |
| 4 | 205 | J.S.R. Chisholm | Generalisation of the Kahane algorithm for scalar products of gamma—matrices. |
| 5 | 416 | A.T. Chivers | A new version of the program to compute the asymptotic solution of coupled equations for electron scattering. |
| 6 | 88 | A.T. Chivers | A new version of the program to compute the fractional parentage coefficients for equivalent d shell electrons. |

| *Vol.* | *Page* | | |
|---|---|---|---|
| 8 | 149 | A.T. Chivers | A general program to calculate atomic continuum processes using the R—matrix method. |
| 7 | 69 | Ph. Choquard | Numerical determination of the critical point in the 3—D Ising model in Wilson's formalism. |
| 1 | 277 | A. Choudry | Isometric representation of two—dimensional matrices. |
| 2 | 322 | B.L. Chrisman | Computer analysis of Mossbauer spectra. |
| 7 | 185 | E.R. Christensen | Monte Carlo simulation of photons in two—layered media for density gauges. |
| 7 | 192 | E.R. Christensen | Computer simulation of photons in spheric media for density gauges. |
| 2 | 127 | J.P. Christiansen | FOUR67, a fast Fourier transform package. |
| 2 | 139 | J.P. Christiansen | DELSQPHI, a two—dimensional Poisson—solver program. |
| 3s | 14 | J.P. Christiansen | Topics in computational fluid mechanics. |
| 7 | 245 | J.P. Christiansen | OLYMPUS — a standard control and utility package for initial—value Fortran programs. |
| 7 | 271 | J.P. Christiansen | MEDUSA — a one—dimensional laser fusion code. |
| 10 | 251 | J.P. Christiansen | Erratum notice. MEDUSA — a one—dimensional laser fusion code. |
| 10 | 258 | J.P. Christiansen | Book review. |
| 10 | 264 | J.P. Christiansen | Adiabatic relaxation to 1D MHD pressure equilibrium. EQUIL: a Fortran module and test program. |
| 2 | 201 | R.E. Christoffersen | High speed evaluation of F0(x). |
| 4 | 299 | G. Cioni | A method for the automatic analysis of gamma ray events in astronomical spark chambers. |
| 2 | 433 | R.G. Clarkson | Energy—loss straggling of heavy charged particles. |
| 8 | 143 | J. Clayton | BATMAN — an automatic batch processing system. |
| 2 | 1 | S. Cohen | The DELPHI—SPEAKEASY SYSTEM. I. Overall description. |
| 2 | 94 | W.R. Coker | Distorted wave Born approximation for nuclear reactions. |
| 2 | 443 | W.R. Coker | Kinematical parameters of nuclear reactions. |
| 3 | 275 | W.R. Coker | Erratum notice. Distorted wave Born approximation for nuclear reactions. |
| 5 | 349 | P.A. Collins | An efficient partial—wave analyser for the absorption model. |
| 1 | 306 | M.J. Conneely | A computer program for the calculation of electron scattering and photoionization cross sections of atomic systems with configuration (np)q. |
| 1 | 470 | M.J. Conneely | Erratum. A computer program for the calculation of electron scattering and photoionization cross sections of atomic systems with configuration (np)q. |
| 5 | 98 | C.S. Cooper | The Durham elementary particle data bank, data analysis and model comparison project. |
| 7 | 289 | J.R.D. Copley | Monte Carlo calculation of multiple scattering effects in thermal neutron scattering experiments. |

| *Vol.* | *Page* | | |
|---|---|---|---|
| 9 | 59 | J.R.D. Copley | Monte Carlo calculation of multiple scattering effects in thermal neutron scattering experiments; modification to slab geometry. |
| 9 | 64 | J.R.D. Copley | Monte Carlo calculation of multiple scattering effects in thermal neutron scattering experiments; modification to horizontal cylinder geometry. |
| 5 | 28 | R.M.J. Cotterill | Melting of microcrystals in two dimensions: a molecular dynamics simulation. |
| 9 | 69 | M.S. Cowler | Calculation of the dynamic response of reactor containment systems to full core explosions. |
| 3 | 314 | J.G. Cramer | Graphical plotting output on a line printer using high—density plotting symbols. |
| 3 | 318 | J.G. Cramer | The reduced rotation matrix. |
| 9 | 79 | D.J. Crennell | Kinematic fitting: an improved method for convergence. |
| 2 | 107 | D.T. Cromer | Relativistic self—consistent field program for atoms and ions. |
| 2 | 471 | D.T. Cromer | Erratum notice. Relativistic self—consistent field program for atoms and ions. |
| 9 | 129 | D.T. Cromer | Erratum notice. Relativistic self—consistent field program for atoms and ions. |
| 3s | 137 | R.A. Crowther | Analysis of biological structure at the atomic and molecular level. |
| 6 | 316 | G. Csanak | Analytical and numerical procedures in the application of many—body Green's function methods to electron—atom scattering problems. |
| 6 | 17 | J. Cugnon | Computation of S—state binding energy and wave functions in a Saxon—Woods potential. |
| 8 | 307 | S. Cuperman | A numerical code for multiple water bag gravitational systems. |
| 2 | 301 | R.E. Dahl Jr. | Computer simulation of extended defects in metals. |
| 3 | 73 | Y. Dandeu | Coulomb functions in entire (eta,rho)—plane. |
| 9 | 173 | J. Darville | Exact computation of the Zeeman effect on nuclear quadrupole resonance profiles for powders (spin I — 3/2). Determination of the asymmetry parameter. |
| 7 | 343 | S.K. Datta | A version of a nuclear optical model code for small computers designed to run on a PDP—15. |
| | | | The computation of the growth of a gaseous discharge in space—charge distorted fields. |
| 3 | 277 | A.R. Davies | DIRAC, dynamic information retrieval of atomic codes. I. Physical design criteria. |
| 6 | 165 | A.R. Davies | Dynamic information retrieval of atomic codes II. Implementation. |
| 10 | 117 | A.R. Davies | TLASER — a CO2 laser kinetics code. |
| 3s | 79 | J.M. Dawson | Contribution of computer simulation to plasma theory. |
| 5 | 225 | P.G. Debrunner | Computer simulations of Mossbauer spectra for an effective spin S—1/2 Hamiltonian. |

| *Vol.* | *Page* | | |
|---|---|---|---|
| 5 | 395 | P.G. Debrunner | Erratum notice. Computer simulations of Mossbauer spectra for an effective spin S—1/2 Hamiltonian. |
| 5 | 104 | S. De Haan | Many—particle interaction problems computed by special purpose processors, with emphasis on the Ising model. |
| 10 | 67 | J.Th.M. de Hosson | Symmetry and bandstructure. |
| 10 | 104 | J.Th.M. de Hosson | Normal coordinate analysis of crystals. |
| 7 | 135 | W. Delaney | Design criteria for a general purpose high—energy physics experiment simulation program. |
| 8 | 396 | J.M. Delbrouck—Habaru | Bound—states of one nucleon in a Woods—Saxon well from a variational method. |
| 4 | 299 | A. della Ventura | A method for the automatic analysis of gamma ray events in astronomical spark chambers. |
| 4 | 186 | F. Demmig | Explicit second order method of characteristics for quasilinear hyperbolic differential equations and applications. |
| 1 | 216 | J.P. Desclaux | Hartree Fock Slater self consistent field calculations. |
| 9 | 31 | J.P. Desclaux | A multiconfiguration relativistic DIRAC—FOCK program. |
| 4 | 275 | H. Dilcher | DESY on—line system. |
| 3 | 136 | P. Dodd | A program for the generation of artificial bubble chamber events. |
| 4 | 268 | R.McD. Dodds | Vector coupling coefficients as products of prime factors. |
| 2 | 272 | D. Donati | Computation of total, differential and double—differential cross sections for compound nuclear reactions of the type (a,b), (a,bgamma) and (a,bgamma—gamma). (III) FORTRAN translations of the ALGOL programs MANDY and BARBARA. |
| 5 | 304 | D. Donati | Erratum notice. Computation of total, differential and double—differential cross sections for compound nuclear reactions of the type (a,b), (a,bgamma) and (a,bgamma—gamma). (III) FORTRAN translations of the ALGOL programs MANDY and BARBARA. |
| 8 | 199 | D.R. Donati | MIA, a FORTRAN—IV program for making spin and parity assignments to high—lying single and coherent twin nuclear levels from (alpha, nucleon) angular distributions in on—resonance, compound—nuclear, channel—spin—1/2 reactions. |
| 5 | 405 | J.P. Draayer | A user's guide to Fortran programs for Wigner and Racah coefficients of SU3. |
| 2 | 427 | O. Dragoun | A program to calculate internal conversion coefficients for all atomic shells without screening. |
| 8 | 396 | D.M. Dubois | Bound—states of one nucleon in a Woods—Saxon well from a variational method. |
| 10 | 155 | H.D. Dudder | RAMSES: a two—dimensional, PIC type laser pulse propagation code. |
| 9 | 360 | P. Dufour | A general purpose Monte—Carlo program. |
| 5 | 69 | R.J. Eastgate | A nuclear optical model code for small computers. |
| 3 | 296 | P.H. Eberhard | The OPTIME system for fitting theoretical expressions. |
| 5 | 163 | P.H. Eberhard | Users manual for the OPTIME system. |

| *Vol.* | *Page* | | |
|---|---|---|---|
| 4 | 294 | K. Eggert | Automatic measurement of streamer chamber pictures. |
| 8 | 130 | R.A. Eisenstein | PIRK: a computer program to calculate the elastic scattering of pions from nuclei. |
| 8 | 270 | W. Eissner | Techniques for the calculation of atomic structures and radiative data including relativistic corrections. |
| 3 | 240 | M. Eldrup | POSITRONFIT: a versatile program for analysing positron lifetime spectra. |
| 7 | 401 | M. Eldrup | POSITRONFIT EXTENDED: a new version of a program for analysing positron lifetime spectra. |
| 7 | 343 | D.O. Elliott | A version of a nuclear optical model code for small computers designed to run on a PDP—15. |
| 8 | 257 | D. Ellison | A numerical method for solving the radiative transfer equation in two—dimensional X—Y geometry. |
| 10 | 133 | M.L. Ellzey Jr. | Complete crystal field calculations including spin—orbit interaction and paramagnetic effects. |
| 9 | 131 | M.E.A. El Tom | On the approximate solution of the delay integral equation of the statistical theory of radiation damage. |
| 4 | 315 | R. Erbe | Recognition of bubble chamber events exemplified by the Heidelberg automatic system. |
| 3 | 322 | C.J. Evans | The computation of the growth of a gaseous discharge in space—charge distorted fields. |
| 2 | 261 | F.H.M. Faisal | A program for calculating the static interaction potential between an electron and a diatomic molecule. |
| 5 | 396 | F.H.M. Faisal | Erratum notice. A program for calculating the static interaction potential between an electron and a diatomic molecule. |
| 10 | 98 | L.S. Fan | Inversion of Abel's integral equation by a direct method. |
| 3 | 273 | D.Q.M. Fay | Book review. |
| 2 | 33 | F.R. Femenia | Energy level calculations in Davydov model. |
| 2 | 168 | F.R. Femenia | CODNUM, a program to change the punching code and to number a deck of cards. |
| 2 | 331 | F.R. Femenia | Electromagnetic M1 reduced transition probabilities for pure and mixed Nilsson states in odd—A nuclei. |
| 4 | 262 | F.R. Femenia | Energy level calculations with Arovmi model. |
| 7 | 145 | F.R. Femenia | Energy—level calculations with the extended Arovmi model. |
| 8 | 377 | D.H. Feng | Coulomb wave functions for all real eta and rho. |
| 10 | 87 | D.H. Feng | Calculations of harmonic oscillator brackets. |
| 10 | 401 | D.H. Feng | PATIWEN — a code for Coulomb—nuclear interference calculations. |
| 5 | 328 | I.F. Ferguson | A program for the calculation of X—ray reflection intensities. |
| 10 | 42 | I.F. Ferguson | A program for the calculation of X—ray reflection intensities, Part 2. |
| 2 | 223 | D. Fick | A program to calculate complex phase shifts and mixing parameters of elastic scattering of spin 1/2 particles on spin 1/2 targets. |

| *Vol.* | *Page* | | |
|---|---|---|---|
| 1 | 151 | C.F. Fischer | A multi—configuration Hartree—Fock program. |
| 2 | 124 | C.F. Fischer | The deferred difference correction for the Numerov method. |
| 4 | 107 | C.F. Fischer | A multi—configuration Hartree—Fock program with improved stability. |
| 5 | 147 | C.F. Fischer | A critical review of programs in atomic structure for bound states. |
| 6 | 157 | C.F. Fischer | Exact evaluation of Slater integrals using ALTRAN, a symbol manipulation language. |
| 7 | 236 | C.F. Fischer | Erratum notice. A multi—configuration Hartree—Fock program with improved stability. |
| 9 | 370 | C.F. Fischer | A new version of AAKF (Reduced Tensor Matrix Elements) adapted to spectroscopic notation. |
| 9 | 381 | C.F. Fischer | Oscillator strengths from numerical MCHF radial functions. |
| 3 | 9 | K.J. Fisher | Calculation of atomic energy level values. |
| 3 | 19 | K.J. Fisher | Wave number calculation from least—squares level values. |
| 3 | 159 | R. Fletcher | Methods for the solution of optimization problems. |
| 7 | 200 | C. Fleurier | Inversion of Abel's integral equation — application to plasma spectroscopy. |
| 1 | 31 | D.R. Flower | A program to calculate radiative recombination coefficients of hydrogenic ions. |
| 8 | 337 | B. Ford | The generalized eigenvalue problem in quantum chemistry. |
| 4 | 173 | W. Forster | Diffusion and heat conduction: a brief survey of numerical methods. |
| 5 | 308 | W. Forster | Erratum. A brief survey of numerical methods. |
| 5 | 24 | X. Fortin | Numerical study of the electronic and thermodynamic properties of the metal — non—metal transition in dense media. |
| 2 | 288 | B.P. Foster | Programs to aid in establishing gamma—ray decay schemes, DCSCH3 and DCSCH4. |
| 3s | 157 | B. French | Panel discussion, high—energy physics. |
| 4 | 275 | H. Frese | DESY on—line system. |
| 2 | 40 | S.J. Gage | Computer—assisted analysis of gamma—ray spectra. |
| 4 | 1 | P. Gara | Direct numerical integration of coupled one—dimensional Schrodinger equations. |
| 7 | 179 | B.S. Garbow | EISPACK — a package of matrix eigensystem routines. |
| 5 | 98 | F.D. Gault | The Durham elementary particle data bank, data analysis and model comparison project. |
| 10 | 223 | C. Gaussorgues | Multistate molecular treatment of atomic collisions in the impact parameter approximation. I. Integration of coupled equations and calculation of transition amplitudes for the straight line case. |
| 3 | 73 | L. Gauthier | Coulomb functions in entire (eta,rho)—plane. |
| 5 | 309 | M.D. Gawlik | Automatic peak analysis on minicomputers. |

| *Vol.* | *Page* | | |
|---|---|---|---|
| 7 | 115 | M.D. Gawlik | Automatic spectrum analysis on minicomputers: doublet resolution by gaussian fit. |
| 4 | 11 | A. Genz | An adaptive multidimensional quadrature procedure. |
| 9 | 173 | A. Gerard | Exact computation of the Zeeman effect on nuclear quadrupole resonance profiles for powders (spin I — 3/2). Determination of the asymmetry parameter. |
| 3 | 53 | M. Gmitro | Generalized transformation brackets for the harmonic oscillator functions. |
| 1 | 420 | J. Goldberg | Conversion of binary magnetic tapes. |
| 8 | 377 | L.J.B. Goldfarb | Coulomb wave functions for all real eta and rho. |
| 3 | 9 | A.S. Goldman | Calculation of atomic energy level values. |
| 3 | 19 | A.S. Goldman | Wave number calculation from least—squares level values. |
| 7 | 344 | L. Goorevich | A program for the analytic simulation of extensive air showers. |
| 2 | 383 | I.P. Grant | Test programs (Letter to the Editor). |
| 4 | 377 | I.P. Grant | CFPJJ—fractional parentage coefficients for equivalent electrons in jj—coupling. |
| 5 | 161 | I.P. Grant | A program to calculate a general recoupling coefficient. |
| 5 | 263 | I.P. Grant | A general program to calculate angular momentum coefficients in relativistic atomic structure. |
| 6 | 98 | I.P. Grant | Erratum. A general program to calculate angular momentum coefficients in relativistic atomic structure. |
| 8 | 257 | I.P. Grant | A numerical method for solving the radiative transfer equation in two—dimensional X—Y geometry. |
| 9 | 46 | P.R. Graves—Morris | A subroutine and procedure for the rapid calculation of simple off—diagonal rational approximants. |
| 10 | 234 | P.R. Graves—Morris | Calculation of Canterbury approximants. |
| 5 | 239 | A.E.S. Green | Electron energy deposition in a gaseous mixture. |
| 4 | 315 | E. Grimm | Recognition of bubble chamber events exemplified by the Heidelberg automatic system. |
| 8 | 101 | R. Gross | Weizmann shell model computational code. |
| 3 | 339 | J.L. Groves | Computer simulation of Mossbauer scattering spectra. |
| 5 | 225 | J.L. Groves | Computer simulations of Mossbauer spectra for an effective spin S—1/2 Hamiltonian. |
| 5 | 395 | J.L. Groves | Erratum notice. Computer simulations of Mossbauer spectra for an effective spin S—1/2 Hamiltonian. |
| 10 | 11 | R. Gruber | THALIA — a one—dimensional magnetohydrodynamic stability program using the method of finite elements. |
| 10 | 30 | R. Gruber | HYMNIA — band matrix package for solving eigenvalue problems. |
| 8 | 31 | P.G. Guest | Errors in eigenvalues calculated by the Numerov—Cooley method. |
| 3 | 73 | J. Guillermin | Coulomb functions in entire (eta,rho)—plane. |
| 4 | 20 | Hs.H. Gunthard | Numerical solution of the eigenvalue problem of infinite matrices in molecular dynamics. |

| *Vol.* | *Page* | | |
|---|---|---|---|
| 4 | 294 | W. Gurich | Automatic measurement of streamer chamber pictures. |
| 4 | 239 | M. Hadj Hassan | A nuclear Hartree—Fock intrinsic wavefunction projection program. |
| 9 | 79 | D.E. Hall | Kinematic fitting: an improved method for convergence. |
| 8 | 337 | G. Hall | The generalized eigenvalue problem in quantum chemistry. |
| 5 | 69 | R.A. Hardekopf | A nuclear optical model code for small computers. |
| 5 | 153 | D.J. Harrison | Computation of effective Regge trajectories for high energy two—body reactions. |
| 8 | 307 | A. Harten | A numerical code for multiple water bag gravitational systems. |
| 5 | 349 | B.J. Hartley | An efficient partial—wave analyser for the absorption model. |
| 5 | 399 | P.W. Hawkes | Compilation of a catalogue of computer programs in electron optics. |
| 4 | 279 | Y. Hazony | Hierarchical computing in laboratory experiments: potential and pitfalls. |
| 4 | 371 | P. Heiss | Computation of cross sections and polarizations for nuclear reactions, in which only spin 1/2 particles are involved. |
| 10 | 155 | D.B. Henderson | RAMSES: a two—dimensional, PIC type laser pulse propagation code. |
| 1 | 306 | R.J.W. Henry | A computer program for the calculation of electron scattering and photoionization cross sections of atomic systems with configuration (np)q. |
| 1 | 470 | R.J.W. Henry | Erratum. A computer program for the calculation of electron scattering and photoionization cross sections of atomic systems with configuration (np)q. |
| 10 | 375 | R.J.W. Henry | Rovibrational cross sections from reactance matrices calculated in adiabatic nuclei approximation. |
| 2 | 59 | D. Herbison—Evans | Derivation of the orbit of a double star from observations made with an intensity interferometer. |
| 2 | 368 | D. Herbison—Evans | Analysis of a variable spectroscopic double star. |
| 5 | 315 | D. Herbison—Evans | The light curve of a variable star subject to orbital tidal distortion. |
| 2 | 33 | E.S. Hernandez | Energy level calculations in Davydov model. |
| 2 | 427 | G. Heuser | A program to calculate internal conversion coefficients for all atomic shells without screening. |
| 1 | 359 | A. Hibbert | A general program for calculating angular momentum integrals in atomic structure. |
| 2 | 180 | A. Hibbert | A new version of a general program to calculate angular momentum integrals in atomic structure. |
| 2 | 181 | A. Hibbert | Adaptation of NJSYM and GENSUM for use with Program WEIGHTS. |
| 6 | 59 | A. Hibbert | Erratum notice. A new version of a general program to calculate angular momentum integrals in atomic structure. |
| 7 | 318 | A. Hibbert | Adaptation of a general program to calculate angular momentum integrals in atomic structure: inclusion of the one—electron part of the hamiltonian. |
| 8 | 329 | A. Hibbert | Adaptation of a general program to calculate angular momentum integrals in atomic structure: inclusion of the checking of the configuration data. |

| *Vol.* | *Page* | | |
|---|---|---|---|
| 9 | 141 | A. Hibbert | CIV3 — a general program to calculate configuration interaction wave functions and electric—dipole oscillator strengths. |
| 10 | 436 | A. Hibbert | Erratum notice. CIV3 — a general program to calculate configuration interaction wave functions and electric—dipole oscillator strengths. |
| 8 | 199 | H.R. Hiddleston | MIA, a FORTRAN—IV program for making spin and parity assignments to high—lying single and coherent twin nuclear levels from (alpha, nucleon) angular distributions in on—resonance, compound—nuclear, channel—spin—1/2 reactions. |
| 4 | 208 | E.R. Hilf | Progress in Weyl's problem achieved by computational methods. |
| 6 | 30 | B. Hird | Nilsson orbits for a particle in a Woods—Saxon potential with Y20 and Y40 deformations, and coupled to core rotational states. |
| 10 | 293 | B. Hird | Deformed quasiparticle states in a Woods—Saxon potential and coupled to rotational states of the core. |
| 9 | 11 | S. Hirschi | COCHASE, a code for coupled channel Schrodinger equations. |
| 1 | 477 | C.A.R. Hoare | Book review. |
| 4 | 275 | G. Hochweller | DESY on—line system. |
| 2 | 127 | R.W. Hockney | FOUR67, a fast Fourier transform package. |
| 2 | 139 | R.W. Hockney | DELSQPHI, a two—dimensional Poisson—solver program. |
| 2 | 11 | V. Hoffstein | Symmetry and band structure. I. Selection of reciprocal lattice vectors. |
| 2 | 17 | V. Hoffstein | Symmetry and band structure. II. Storage and retrieval of group theoretical information. |
| 2 | 26 | V. Hoffstein | Symmetry and band structure. III. Construction of symmetrized Hamiltonian matrix. |
| 2 | 341 | V. Hoffstein | Program for calculating LEED intensities using band structure—matching formalism. |
| 4 | 361 | V. Hoffstein | Symmetrized program for calculating energy bands and electronic structure of solids. |
| 7 | 50 | V. Hoffstein | Program for calculating LEED intensities based on the inelastic collision model: I. Matrix inversion method. |
| 9 | 69 | N.E. Hoskin | Calculation of the dynamic response of reactor containment systems to full core explosions. |
| 3 | 22 | B. Houssais | Hartree—Fock nuclear calculations with gaussian potentials. |
| 4 | 239 | B. Houssais | A nuclear Hartree—Fock intrinsic wavefunction projection program. |
| 10 | 293 | K.H. Huang | Deformed quasiparticle states in a Woods—Saxon potential and coupled to rotational states of the core. |
| 1 | 225 | L.B. Hubbard | Coefficients of fractional parentage in j—j coupling in the isospin representation. |
| 1 | 453 | L.B. Hubbard | Allowed values of coupled angular momentum and i—spin for nucleons in a single shell in j—j coupling. |
| 2 | 449 | L.B. Hubbard | Gamma—radiation dosimetry for arbitrary source and target geometry. |

| *Vol.* | *Page* | | |
|---|---|---|---|
| 5 | 395 | L.B. Hubbard | Erratum notice. Gamma—radiation dosimetry for arbitrary source and target geometry. |
| 6 | 240 | L.B. Hubbard | First collision gamma—ray dose. |
| 1 | 343 | A. Hubert | Symmetric Neel walls in thin magnetic films. |
| 1 | 468 | A. Hubert | Symmetric Neel walls in thin magnetic films. An adaptation to increase the range of convergence. |
| 2 | 157 | M.H. Hughes | Solution of Poisson's equation in cylindrical coordinates. |
| 8 | 118 | M.H. Hughes | TIMER — a software instrumentation routine for making timing measurements. |
| 8 | 123 | M.H. Hughes | OLYMPUS restart facilities. |
| 9 | 51 | M.H. Hughes | OLYMPUS and preprocessor package for an IBM 370/165. |
| 10 | 167 | M.H. Hughes | OLYMPUS control and utility package for the CDC 6500. |
| 6 | 38 | D.G. Hummer | Numerical evaluation of the formal solution of radiative transfer problems in spherical geometries. |
| 5 | 153 | A.C. Irving | Computation of effective Regge trajectories for high energy two—body reactions. |
| 7 | 95 | D.J.G. Irwin | A program for the extraction of radiative lifetimes from experimental beam—foil intensity decay data. |
| 5 | 299 | Md.M. Islam | A routine for calculating the form—factor and the electrical resistivity of liquid N.F.E. metals. |
| 5 | 11 | F.M. Izrailev | Numerical experiments on the statistical behaviour of dynamical systems with a few degrees of freedom. |
| 5 | 217 | A. Jabs | Approximation formula and ALGOL program of the Lorentz—invariant momentum—space integral for particles of equal masses. |
| 9 | 297 | S. Jadach | Rapidity generator for Monte—Carlo calculations of cylindrical phase space. |
| 3s | 157 | F. James | Panel discussion, high—energy physics. |
| 10 | 343 | F. James | MINUIT: a system for function minimization and analysis of the parameter errors and correlations. |
| 1 | 437 | M.J. Jamieson | A program to calculate the radial parts of interaction matrix elements between two hydrogenic wave functions as power series. |
| 2 | 433 | N. Jarmie | Energy—loss straggling of heavy charged particles. |
| 5 | 28 | E.J. Jensen | Melting of microcrystals in two dimensions: a molecular dynamics simulation. |
| 2 | 231 | J.P. Jeukenne | Computation of Brody—Moshinsky brackets. |
| 6 | 358 | C.J. Joachain | Eikonal theory of electron—atom collisions. |
| 3 | 69 | C.H.J. Johnson | On the computation of third virial coefficients. |
| 6 | 65 | C.H.J. Johnson | The computation of fourth virial coefficients for pairwise—additive spherically symmetric interaction potentials. |
| 4 | 165 | D.J. Jones | The numerical solution of elliptic equations by the method of lines. |

| *Vol.* | *Page* | | |
|---|---|---|---|
| 7 | 353 | M. Jones | A method for calculating the algebra of matrix elements for photoionisation and line radiation. |
| 8 | 270 | M. Jones | Techniques for the calculation of atomic structures and radiative data including relativistic corrections. |
| 2 | 420 | J. Joseph | SU3 fractional parentage in the 1p—shell. |
| 3 | 118 | V. Joshi | Differential cross sections for electric quadrupole Coulomb excitation. |
| 3s | 127 | H.G. Junginger | Computation of electronic properties of solids. |
| 4 | 289 | V.I. Kadashevich | Application of multi—users on—line system to nuclear and solid—state physics at Gatchina's reactor WWR—M. |
| 2 | 207 | K. Kajantie | The evaluation of the volume of the phase space of n particles. |
| 1 | 10 | U. Kammerer | Ginzburg—Landau fluxoids. |
| 1 | 291 | U. Kammerer | Erratum. Ginzburg—Landau fluxoids. |
| 2 | 223 | R. Kankowsky | A program to calculate complex phase shifts and mixing parameters of elastic scattering of spin 1/2 particles on spin 1/2 targets. |
| 2 | 207 | V. Karimaki | The evaluation of the volume of the phase space of n particles. |
| 9 | 182 | J. Kasman | Monte Carlo simulation of the diffractive excitation model. |
| 4 | 20 | J. Keller | Numerical solution of the eigenvalue problem of infinite matrices in molecular dynamics. |
| 4 | 315 | E. Keppel | Recognition of bubble chamber events exemplified by the Heidelberg automatic system. |
| 9 | 337 | W. Kerner | A contribution to the efficient solution of extensive symbolic computations. |
| 6 | 195 | D.P. Kerr | High resolution graphical plotting on a typewriter terminal. |
| 7 | 419 | I.F. Kerr | Program for calculating work functions from photoelectric data. |
| 3 | 240 | P. Kirkegaard | POSITRONFIT: a versatile program for analysing positron lifetime spectra. |
| 7 | 401 | P. Kirkegaard | POSITRONFIT EXTENDED: a new version of a program for analysing positron lifetime spectra. |
| 5 | 328 | J.E. Kirwan | A program for the calculation of X—ray reflection intensities. |
| 10 | 421 | E. Kisak | A finite element program package for magnetotelluric modelling. |
| 1 | 425 | W. Kittel | A Monte Carlo generation method with importance sampling for high energy collisions of hadrons. |
| 2 | 239 | M. Klapisch | A program for atomic wavefunction computations by the parametric potential method. |
| 9 | 102 | W.—D. Klotz | A general program to calculate the matrix of the spin—orbit interaction. |
| 10 | 56 | W.—D. Klotz | Reduced matrix elements of summations of one—particle tensor products. |
| 10 | 70 | W.—D. Klotz | Erratum notice. A general program to calculate the matrix of the spin—orbit interaction. |

| *Vol.* | *Page* | | |
|---|---|---|---|
| 6 | 187 | R. Klucker | Kramers — Kronig analysis of reflection data. |
| 3 | 31 | G. Kluge | Direct computation of the magnetic shell parameter. |
| 3 | 36 | G. Kluge | Numerical fits for the geomagnetic shell parameter. |
| 4 | 347 | G. Kluge | Geomagnetic field models: scalar and vector potential, induction vector and its gradient tensor computed by a common algorithm. |
| 1 | 167 | H.O. Knox | Computation of wavefunctions for the helium isoelectronic sequence. |
| 3 | 296 | W.O. Koellner | The OPTIME system for fitting theoretical expressions. |
| 5 | 163 | W.O. Koellner | Users manual for the OPTIME system. |
| 4 | 214 | K.S. Kolbig | Remarks on the computation of Coulomb wavefunctions. |
| 4 | 221 | K.S. Kolbig | Programs for computing the logarithm of the gamma function and the digamma function for complex argument. |
| 3 | 155 | B. Kolman | Computer generated Weyl groups. |
| 6 | 24 | B. Kolman | Freudenthal's inner multiplicity formula. |
| 8 | 95 | B. Kolman | Racah's outer multiplicity formula. |
| 4 | 289 | I.A. Kondurov | Application of multi—users on—line system to nuclear and solid—state physics at Gatchina's reactor WWR—M. |
| 5 | 437 | A. Konrad | A finite element program package for axisymmetric scalar field problems. |
| 9 | 193 | A. Konrad | A finite element program package for axisymmetric vector field problems. |
| 3s | 157 | L. Kowarski | Panel discussion, high—energy physics. |
| 5 | 28 | W.D. Kristensen | Melting of microcrystals in two dimensions: a molecular dynamics simulation. |
| 4 | 315 | D. Kropp | Recognition of bubble chamber events exemplified by the Heidelberg automatic system. |
| 4 | 275 | P. Kuhlmann | DESY on—line system. |
| 6 | 38 | C.V. Kunasz | Numerical evaluation of the formal solution of radiative transfer problems in spherical geometries. |
| 10 | 304 | C.V. Kunasz | Transfer of line radiation in optically thick media allowing for transport of excitation energy: the resonant doublet. |
| 6 | 38 | P.B. Kunasz | Numerical evaluation of the formal solution of radiative transfer problems in spherical geometries. |
| 10 | 304 | P.B. Kunasz | Transfer of line radiation in optically thick media allowing for transport of excitation energy: the resonant doublet. |
| 3 | 277 | K.L. Kwok | DIRAC, dynamic information retrieval of atomic codes. I. Physical design criteria. |
| 6 | 165 | K.L. Kwok | Dynamic information retrieval of atomic codes II. Implementation. |
| 2 | 420 | J. Lafoucriere | SU3 fractional parentage in the 1p—shell. |
| 7 | 174 | E.W. Laing | Book review. |
| 5 | 430 | T.S. Lakshmanan | Simulation of chemical profiles during electrotransport. |

| *Vol.* | *Page* | | |
|---|---|---|---|
| 4 | 239 | M. Lambert | A nuclear Hartree—Fock intrinsic wavefunction projection program. |
| 1 | 440 | J. Lang | Spectral intensity, angular distribution and polarisation of synchrotron radiation from a monoenergetic electron. |
| 2 | 79 | J. Lang | A procedure for nonlinear least squares refinement in adverse practical conditions. |
| 5 | 308 | J. Lang | Erratum notice. A procedure for nonlinear least squares refinement in adverse practical conditions. |
| 4 | 333 | P. Lapostolle | Two—dimensional computer simulation of high intensity proton beams. |
| 3 | 118 | S.M. Lea | Differential cross sections for electric quadrupole Coulomb excitation. |
| 4 | 333 | R. le Bail | Two—dimensional computer simulation of high intensity proton beams. |
| 2 | 231 | A. Lejeune | Computation of Brody—Moshinsky brackets. |
| 3 | 73 | T. Lena | Coulomb functions in entire (eta,rho)—plane. |
| 3 | 36 | K.G. Lenhart | Numerical fits for the geomagnetic shell parameter. |
| 1 | 265 | M.N. Lewis | Single—particle substitution sums in the second—order Z—expansion theory of atomic energies. |
| 1 | 325 | M.N. Lewis | Hydrogenic Rk integrals. |
| 1 | 469 | M.N. Lewis | Erratum notice. Single—particle substitution sums in the second—order Z—expansion theory of atomic energies. |
| 1 | 469 | M.N. Lewis | Erratum notice. Hydrogenic Rk integrals. |
| 2 | 107 | D.A. Liberman | Relativistic self—consistent field program for atoms and ions. |
| 2 | 471 | D.A. Liberman | Erratum notice. Relativistic self—consistent field program for atoms and ions. |
| 9 | 129 | D.A. Liberman | Erratum notice. Relativistic self—consistent field program for atoms and ions. |
| 1 | 306 | L. Lipsky | A computer program for the calculation of electron scattering and photoionization cross sections of atomic systems with configuration (np)q. |
| 1 | 470 | L. Lipsky | Erratum. A computer program for the calculation of electron scattering and photoionization cross sections of atomic systems with configuration (np)q. |
| 10 | 167 | G.G. Lister | OLYMPUS control and utility package for the CDC 6500. |
| 7 | 95 | A.E. Livingston | A program for the extraction of radiative lifetimes from experimental beam—foil intensity decay data. |
| 10 | 182 | M.A.K. Lodhi | Solution of bound state problems in nuclear shell model with momentum dependent potentials. |
| 2 | 368 | N.R. Lomb | Analysis of a variable spectroscopic double star. |
| 9 | 11 | E. Lomon | COCHASE, a code for coupled channel Schrodinger equations. |
| 10 | 264 | J.W. Long | Adiabatic relaxation to 1D MHD pressure equilibrium. EQUIL: a Fortran module and test program. |
| 3 | 118 | A.B. Lopez—Cepero | Differential cross sections for electric quadrupole Coulomb excitation. |

| *Vol.* | *Page* | | |
|---|---|---|---|
| 2 | 353 | L. Lovitch | Bound state solution of the two—nucleon Schroedinger equation with tensor forces. |
| 4 | 138 | L. Lovitch | The two—nucleon effective—range parameters with tensor forces. |
| 8 | 349 | K.S. Low | Exact finite range DWBA calculations for heavy—ion induced nuclear reactions. |
| 3s | v | G.R. Macleod | Preface. |
| 10 | 368 | W.C. Maguire | Vibrational energies of CO2. |
| 7 | 121 | D. Maison | Subtracted generalized polylogarithms and the SINAC program. |
| 4 | 327 | V.G. Makhankov | Computer investigation of nonlinear dynamical problems of plasma theory. |
| 1 | 380 | V. Malaviya | Computation of charge transfer probability between protons and excited hydrogen atoms. |
| 7 | 85 | I. Manning | Depth distribution of energy deposition by ion bombardment. |
| 5 | 379 | L. Marquez | Nearly exact calculation of the solution of the radial Schrodinger equation. |
| 5 | 153 | A.D. Martin | Computation of effective Regge trajectories for high energy two—body reactions. |
| 5 | 28 | J.W. Martin | Melting of microcrystals in two dimensions: a molecular dynamics simulation. |
| 1 | 349 | F.N. Masri | I. Program for calculating degenerate Raman bands of symmetric tops with an adaptation for infrared bands. |
| 2 | 87 | F.N. Masri | II. Program for calculating triply degenerate Raman bands of spherical tops with an adaptation for infrared bands. |
| 2 | 298 | F.N. Masri | I. A FORTRAN program for calculating degenerate Raman bands of symmetric tops with an adaptation for infrared bands. |
| 2 | 299 | F.N. Masri | II. A FORTRAN program for calculating degenerate Raman bands of spherical tops with an adaptation for infrared bands. |
| 4 | 20 | E. Mathier | Numerical solution of the eigenvalue problem of infinite matrices in molecular dynamics. |
| 2 | 272 | S. Mathur | Computation of total, differential and double—differential cross sections for compound nuclear reactions of the type (a,b), (a,bgamma) and (a,bgamma—gamma). (III) FORTRAN translations of the ALGOL programs MANDY and BARBARA. |
| 5 | 304 | S. Mathur | Erratum notice. Computation of total, differential and double—differential cross sections for compound nuclear reactions of the type (a,b), (a,bgamma) and (a,bgamma—gamma). (III) FORTRAN translations of the ALGOL programs MANDY and BARBARA. |
| 3 | 130 | O. Matsuoka | Field and field gradient integrals based on gaussian type orbitals. |
| 8 | 143 | R. Matthews | BATMAN — an automatic batch processing system. |
| 7 | 235 | D.F. Mayers | Book review. |
| 9 | 1 | F.J. McCormack | FORMAC routine for computing the matrix elements of the linearized cross—collision operators of gaseous mixtures. |

| *Vol.* | *Page* | | |
|---|---|---|---|
| 6 | 77 | M.R.C. McDowell | Phase shift analysis and consistency checks on electron—atom collision data. |
| 7 | 38 | M.R.C. McDowell | Electron impact excitation cross sections. |
| 10 | 1 | W. McKay | Eigenstates and eigenvalues of labelling operators for O(3) bases of U(3) representations. |
| 2 | 238 | B. McNamara | Book review. |
| 8 | 246 | J.E. McNulty | Fractional parentage coefficients for equivalent f shell electrons. |
| 7 | 419 | C.H.B. Mee | Program for calculating work functions from photoelectric data. |
| 4 | 89 | C. Mercier—Soubbaramayer | Numerical simulation of the evolution of a plasma in a confinement device. |
| 2 | 420 | J. Meyer | SU3 fractional parentage in the 1p—shell. |
| 7 | 410 | M.J. Miketinac | Calculation of the equilibrium structure and oscillations of polytropic stars pervaded by toroidal magnetic fields. |
| 6 | 195 | D.M. Miller | High resolution graphical plotting on a typewriter terminal. |
| 8 | 130 | G.A. Miller | PIRK: a computer program to calculate the elastic scattering of pions from nuclei. |
| 6 | 195 | G.E. Miller | High resolution graphical plotting on a typewriter terminal. |
| 6 | 372 | B.L. Moiseiwitsch | Higher Born, Pade and Schwinger variational methods. |
| 2 | 11 | O. Moller | Symmetry and band structure. I. Selection of reciprocal lattice vectors. |
| 2 | 17 | O. Moller | Symmetry and band structure. II. Storage and retrieval of group theoretical information. |
| 2 | 26 | O. Moller | Symmetry and band structure. III. Construction of symmetrized Hamiltonian matrix. |
| 2 | 55 | C.F. Moore | Printer—plotter routine. |
| 2 | 443 | C.F. Moore | Kinematical parameters of nuclear reactions. |
| 2 | 470 | C.F. Moore | A new version of a printer—plotter routine. |
| 6 | 198 | D.R. Moore | Difference methods for time—dependent two—dimensional convection. |
| 5 | 349 | R.W. Moore | An efficient partial—wave analyser for the absorption model. |
| 2 | 360 | D.L. Moores | Amplitudes for scattering of electrons by hydrogenic and alkali—like atomic systems. |
| 4 | 147 | D.L. Moores | Book review. |
| 3 | 1 | H. Moraal | A program for the extraction of bulk viscosities from sound absorption data. |
| 5 | 64 | K. Morgan | An expansion equation of state subroutine. |
| 7 | 38 | L. Morgan | Electron impact excitation cross sections. |
| 5 | 349 | K.J.M. Moriarty | An efficient partial—wave analyser for the absorption model. |
| 9 | 85 | K.J.M. Moriarty | A plotting package for visual comparison of points and curves. |
| 6 | 89 | A.H. Moussa | Atomic integral containing three odd powers of interelectronic separation coordinates. |

| Vol. | Page | | |
|---|---|---|---|
| 4 | 294 | W. Moze | Automatic measurement of streamer chamber pictures. |
| 2 | 214 | G.P. Mueller | Rapid evaluation of four—body cluster contributions. |
| 7 | 85 | G.P. Mueller | Depth distribution of energy deposition by ion bombardment. |
| 2 | 79 | R. Muller | A procedure for nonlinear least squares refinement in adverse practical conditions. |
| 5 | 308 | R. Muller | Erratum notice. A procedure for nonlinear least squares refinement in adverse practical conditions. |
| 5 | 225 | E. Munck | Computer simulations of Mossbauer spectra for an effective spin S—1/2 Hamiltonian. |
| 5 | 395 | E. Munck | Erratum notice. Computer simulations of Mossbauer spectra for an effective spin S—1/2 Hamiltonian. |
| 4 | 299 | P. Mussio | A method for the automatic analysis of gamma ray events in astronomical spark chambers. |
| 7 | 38 | V.P. Myerscough | Electron impact excitation cross sections. |
| 6 | 77 | P.F. Naccache | Phase shift analysis and consistency checks on electron—atom collision data. |
| 10 | 260 | J. Nadrchal | Summer school on computing techniques in physics. |
| 2 | 420 | R.S. Nahabetian | SU3 fractional parentage in the 1p—shell. |
| 8 | 85 | J.C. Nash | The hermitian matrix eigenproblem Hx — eSx using compact array storage. |
| 4 | 157 | I.P. Nedelkov | Improper problems in computational physics. |
| 6 | 275 | R.K. Nesbet | Matrix variational method. |
| 9 | 231 | N. Neto | Numerical calculations of the irreducible representations of space groups. |
| 3 | 269 | P.D. Neufeld | Program ACQN to calculate transport collision integrals adapted to run on IBM computers. |
| 4 | 289 | S.N. Nickolaev | Application of multi—users on—line system to nuclear and solid—state physics at Gatchina's reactor WWR—M. |
| 6 | 187 | U. Nielsen | Kramers — Kronig analysis of reflection data. |
| 3s | 92 | S.G. Nilsson | Nuclear potential—energy surfaces and the half—lives of heavy and super—heavy elements. |
| 1 | 88 | D.W. Norcross | Asymptotic solution of coupled equations for electron scattering. |
| 6 | 257 | D.W. Norcross | Numerical methods in asymptotic regions. |
| 6 | 97 | M.J. Norgett | Book review. |
| 4 | 20 | P. Nosberger | Numerical solution of the eigenvalue problem of infinite matrices in molecular dynamics. |
| 5 | 365 | M.E. Noz | Analytic formulation of SU(3) vector coupling coefficients for n particles. |
| 1 | 191 | H. Nussbaumer | Vector coupling coefficients for complex atoms. |
| 8 | 270 | H. Nussbaumer | Techniques for the calculation of atomic structures and radiative data including relativistic corrections. |

| *Vol.* | *Page* | | |
|---|---|---|---|
| 6 | 331 | J. Nuttall | The use of analyticity in atomic scattering calculations. |
| 8 | 49 | M.J. O'Connell | Search program for significant variables. |
| 8 | 56 | M.J. O'Connell | Multivariate least squares fitting program using modified Gram—Schmidt transformations. |
| 2 | 47 | H. O'Hara | Transport collision integrals for a dilute gas. |
| 2 | 173 | H. O'Hara | Erratum notice. Transport collision integrals for a dilute gas. |
| 5 | 430 | D.L. Olson | Simulation of chemical profiles during electrotransport. |
| 1 | 281 | U. Opik | The Madelung potential and electric field intensity for a sodium chloride and for a caesium chloride lattice. |
| 4 | 151 | E.L. Ortiz | A recursive method for the approximate expansion of functions in a series of polynomials. |
| 4 | 40 | W. Pachelski | On the filtering technique of the least squares estimation of parameters. |
| 5 | 123 | J.C. Packer | The OPIT system. I. A file—handling scheme for data in large applications programs. |
| 5 | 400 | E. Pagiola | Software concepts for large application programs. |
| 6 | 1 | J. Paldus | Computer generation of Feynman diagrams for perturbation theory. I. General algorithm. |
| 6 | 9 | J. Paldus | Computer generation of Feynman diagrams for perturbation theory. II.Program description. |
| 7 | 207 | D.A. Papaconstant—opoulos | Calculation of crystal potentials. |
| 5 | 283 | L.A. Parcell | Solution of differential equations for exchange matrix elements in heavy particle collisions. |
| 4 | 257 | J.R. Parkinson | A program for normalised Morse functions. |
| 3s | 139 | J.R. Pasta | The heuristic value of computers in physics. |
| 10 | 1 | J. Patera | Eigenstates and eigenvalues of labelling operators for O(3) bases of U(3) representations. |
| 5 | 397 | T.N.L. Patterson | Book review. |
| 9 | 392 | H.C. Pauli | A computer program for internal conversion coefficients and particle parameters. |
| 4 | 100 | A.D. Payne | Computation of the Einstein tensor with FORMAC. |
| 7 | 13 | G.L. Payne | FORTRAN program to calculate finite—range no—recoil DWBA transfer cross sections. |
| 4 | 339 | R.S. Peckover | Convection in the presence of magnetic fields. |
| 6 | 198 | R.S. Peckover | Difference methods for time—dependent two—dimensional convection. |
| 5 | 28 | L.B. Pedersen | Melting of microcrystals in two dimensions: a molecular dynamics simulation. |
| 3s | 33 | C.L. Pekeris | Geophysics. |
| 2 | 114 | I.C. Percival | Classical relative motion of 2 particles. |

| *Vol.* | *Page* | | |
|---|---|---|---|
| 3 | 180 | I.C. Percival | Stirling FORDOC 01. A set of documentation conventions for FORTRAN packages and routines. |
| 3 | 197 | I.C. Percival | Classical relative motion of 2 particles (EVAR edition 02). |
| 3 | 221 | I.C. Percival | Classical motion of 2 particles (EVA2 edition 01). |
| 6 | 347 | I.C. Percival | Monte Carlo methods for classical collisions between electrons and atoms. |
| 3 | 73 | J.M. Pernet | Coulomb functions in entire (eta,rho)—plane. |
| 9 | 305 | R. Perrin | Colour coordinate calculations. |
| 1 | 67 | B.I. Persson | Versatile program for analysis of Mossbauer spectra. |
| 7 | 121 | A. Petermann | Subtracted generalized polylogarithms and the SINAC program. |
| 5 | 239 | L.R. Peterson | Electron energy deposition in a gaseous mixture. |
| 4 | 82 | L.G.K. Petravic | Automatic production of programs for solving partial differential equations by finite difference methods. |
| 4 | 82 | M. Petravic | Automatic production of programs for solving partial differential equations by finite difference methods. |
| 10 | 223 | R.D. Piacentini | Multistate molecular treatment of atomic collisions in the impact parameter approximation. I. Integration of coupled equations and calculation of transition amplitudes for the straight line case. |
| 5 | 294 | R. Piessens | Calculation of the radial distribution of emitters in a cylindrical source. |
| 4 | 117 | P. Pirila | Recursive numerical integration of multi—particle phase space with peripheral matrix element. |
| 2 | 394 | V. Pless | A track matching program for bubble chamber photographs. |
| 6 | 157 | D.W.B. Prentice | Exact evaluation of Slater integrals using ALTRAN, a symbol manipulation language. |
| 5 | 136 | J.A. Prentice | The OPIT system. II. Job control and scheduling for large applications programs. |
| 6 | 89 | H.M.A. Radi | Atomic integral containing three odd powers of interelectronic separation coordinates. |
| 3 | 9 | L.J. Radziemski Jr. | Calculation of atomic energy level values. |
| 3 | 19 | L.J. Radziemski Jr. | Wave number calculation from least—squares level values. |
| 9 | 392 | U. Raff | A computer program for internal conversion coefficients and particle parameters. |
| 4 | 59 | J. Ranft | Monte Carlo calculation of hadronic cascades at high energy. |
| 7 | 327 | J. Ranft | Monte Carlo programs for calculating three—dimensional high—energy (50 MeV—500GeV) hadron cascades in matter. |
| 8 | 320 | D.C. Rapaport | Computer generation of connected graphs. |
| 4 | 275 | E. Raubold | DESY on—line system. |
| 4 | 361 | D.K. Ray | Symmetrized program for calculating energy bands and electronic structure of solids. |
| 6 | 303 | W.P. Reinhardt | Fredholm calculation of electron—atom scattering amplitudes using Lxx2 basis sets. |

| Vol. | Page | | |
|---|---|---|---|
| 4 | 193 | E. Remiddi | Radiative correction in quantum electrodynamics. |
| 5 | 430 | D.A. Rigney | Simulation of chemical profiles during electrotransport. |
| 1 | 457 | W.D. Robb | A program to generate numerical orbital functions. |
| 4 | 16 | W.D. Robb | The use of the R—matrix method in atomic calculations. |
| 6 | 132 | W.D. Robb | A program to evaluate the reduced matrix elements of summations of one—particle tensor operators. |
| 8 | 149 | W.D. Robb | A general program to calculate atomic continuum processes using the R—matrix method. |
| 9 | 268 | W.D. Robb | Erratum notice. A program to evaluate the reduced matrix elements of summations of one—particle tensor operators. |
| 8 | 118 | A.P.V. Roberts | TIMER — a software instrumentation routine for making timing measurements. |
| 9 | 46 | D.E. Roberts | A subroutine and procedure for the rapid calculation of simple off—diagonal rational approximants. |
| 10 | 234 | D.E. Roberts | Calculation of Canterbury approximants. |
| 1 | 1 | K.V. Roberts | The publication of scientific FORTRAN programs. |
| 2 | 385 | K.V. Roberts | Practical techniques in computer programming. |
| 3s | 14 | K.V. Roberts | Topics in computational fluid mechanics. |
| 4 | 82 | K.V. Roberts | Automatic production of programs for solving partial differential equations by finite difference methods. |
| 7 | 237 | K.V. Roberts | An introduction to the OLYMPUS system. |
| 7 | 245 | K.V. Roberts | OLYMPUS — a standard control and utility package for initial—value Fortran programs. |
| 7 | 271 | K.V. Roberts | MEDUSA — a one—dimensional laser fusion code. |
| 8 | 123 | K.V. Roberts | OLYMPUS restart facilities. |
| 9 | 51 | K.V. Roberts | OLYMPUS and preprocessor package for an IBM 370/165. |
| 10 | 11 | K.V. Roberts | THALIA — a one—dimensional magnetohydrodynamic stability program using the method of finite elements. |
| 10 | 167 | K.V. Roberts | OLYMPUS control and utility package for the CDC 6500. |
| 10 | 251 | K.V. Roberts | Erratum notice. MEDUSA — a one—dimensional laser fusion code. |
| 10 | 264 | K.V. Roberts | Adiabatic relaxation to 1D MHD pressure equilibrium. EQUIL: a Fortran module and test program. |
| 9 | 51 | P.D. Roberts | OLYMPUS and preprocessor package for an IBM 370/165. |
| 6 | 99 | V.C. Rogers | Computation of total and differential cross sections for compound nuclear reactions of the type (a,a), (a,a'), (a,b), (a,gamma), (a,gamma—gamma), (a,bgamma) and (a,bgamma—gamma). (IV) Fortran program CINDY. |
| 10 | 343 | M. Roos | MINUIT: a system for function minimization and analysis of the parameter errors and correlations. |
| 2 | 353 | S. Rosati | Bound state solution of the two—nucleon Schroedinger equation with tensor forces. |


3s — Supplement to Vol.3

| Vol. | Page | | |
|---|---|---|---|
| 4 | 138 | S. Rosati | The two—nucleon effective—range parameters with tensor forces. |
| 8 | 35 | F. Rosel | Quantum mechanical coupled channels code for Coulomb excitation. |
| 4 | 33 | J.T. Routti | Interactive graphical computing for simulating and unfolding measured distributions. |
| 7 | 327 | J.T. Routti | Monte Carlo programs for calculating three—dimensional high—energy (50 MeV—500GeV) hadron cascades in matter. |
| 9 | 69 | A.G. Rowlinson | Calculation of the dynamic response of reactor containment systems to full core explosions. |
| 10 | 245 | G. Rudnicki—Bujnowski | Explicit formulas for Clebsch—Gordan coefficients. |
| 7 | 369 | J. Rundgren | LEED intensity curves by the layer—by—layer method and perturbation calculation. |
| 9 | 312 | J. Rundgren | Symmetrization and calculation of LEED intensity patterns. |
| 5 | 89 | R.D. Russell | Intermediate—level programming languages for on—line data acquisition and control. |
| 4 | 289 | Yu.F. Ryabov | Application of multi—users on—line system to nuclear and solid—state physics at Gatchina's reactor WWR—M. |
| 1 | 25 | F. Rybicki | Coulomb functions for complex energies. |
| 2 | 94 | F. Rybicki | Distorted wave Born approximation for nuclear reactions. |
| 3 | 275 | F. Rybicki | Erratum notice. Distorted wave Born approximation for nuclear reactions. |
| 3 | 276 | F. Rybicki | Erratum notice. Coulomb functions for complex energies. |
| 8 | 35 | J.X. Saladin | Quantum mechanical coupled channels code for Coulomb excitation. |
| 9 | 247 | M. Salem | ILTHII — analysis of the spectrum of a thermal radioastronomical source. |
| 9 | 258 | M. Salem | Computation of line and continuum radiation from thermal radioastronomical sources. |
| 10 | 223 | A. Salin | Multistate molecular treatment of atomic collisions in the impact parameter approximation. I. Integration of coupled equations and calculation of transition amplitudes for the straight line case. |
| 7 | 369 | A. Salwen | LEED intensity curves by the layer—by—layer method and perturbation calculation. |
| 9 | 312 | A. Salwen | Symmetrization and calculation of LEED intensity patterns. |
| 2 | 455 | M. Samuel | Calculation of electric quadrupole radial matrix elements for Coulomb excitation. |
| 1 | 232 | H.E. Saraph | Collision strengths from reactance matrices. |
| 3 | 256 | H.E. Saraph | Fine structure cross sections from reactance matrices. |
| 7 | 69 | R.R. Sari | Numerical determination of the critical point in the 3—D Ising model in Wilson's formalism. |
| 5 | 239 | T. Sawada | Electron energy deposition in a gaseous mixture. |
| 9 | 370 | K.M.S. Saxena | A new version of AAKF (Reduced Tensor Matrix Elements) adapted to spectroscopic notation. |

| *Vol.* | *Page* | | |
|---|---|---|---|
| 9 | 381 | K.M.S. Saxena | Oscillator strengths from numerical MCHF radial functions. |
| 9 | 360 | J. Schlesinger | A general purpose Monte—Carlo program. |
| 4 | 315 | H. Schneider | Recognition of bubble chamber events exemplified by the Heidelberg automatic system. |
| 9 | 205 | H. Schneider | Computer—drawn trajectories of particles in mutual and external fields — an application of computers in university physics teaching. |
| 5 | 17 | P. Schofield | Computer simulation studies of the liquid state. |
| 7 | 215 | B. Schorr | Programs for the Landau and the Vavilov distributions and the corresponding random numbers. |
| 4 | 73 | J.W. Schot | Computer solutions of some transport phenomena problems. |
| 7 | 389 | M. Schumacher | Form factor program for Rayleigh scattering of gamma rays by bound electrons. |
| 10 | 257 | M. Schumacher | Erratum notice. Form factor program for Rayleigh scattering of gamma rays by bound electrons. |
| 5 | 24 | R. Schuttler | Numerical study of the electronic and thermodynamic properties of the metal — non—metal transition in dense media. |
| 3s | 127 | M.F.H. Schuurmans | Computation of electronic properties of solids. |
| 1 | 31 | M.J. Seaton | A program to calculate radiative recombination coefficients of hydrogenic ions. |
| 6 | 247 | M.J. Seaton | Close coupling. |
| 6 | 229 | F. Seiler | A program calculating the formulae for polarization effects in nuclear reactions. |
| 1 | 207 | J. Shapiro | Arbitrary 3n—j symbols for SU(2). |
| 10 | 1 | R.T. Sharp | Eigenstates and eigenvalues of labelling operators for O(3) bases of U(3) representations. |
| 4 | 95 | W. Sharp | Computer simulation of anisotropic magnetoplasma systems in cylindrical and toroidal geometry. |
| 4 | 327 | B.G. Shchinov | Computer investigation of nonlinear dynamical problems of plasma theory. |
| 1 | 35 | E. Sheldon | Computation of total, differential, and double—differential cross sections for compound nuclear reactions of the type (a,b), (a,bgamma) and (a,bgamma—gamma) (II) Generalized programs MANDY and BARBARA for arbitrary angular momenta in Hauser—Feshbach—Moldauer formalism. |
| 1 | 224 | E. Sheldon | Erratum. Computation of total, differential, and double—differential cross sections for compound nuclear reactions of the type (a,b), (a,bgamma) and (a,bgamma—gamma) (II) Generalized programs MANDY and BARBARA for arbitrary angular momenta in Hauser—Feshbach—Moldauer formalism. |
| 2 | 272 | E. Sheldon | Computation of total, differential and double—differential cross sections for compound nuclear reactions of the type (a,b), (a,bgamma) and (a,bgamma—gamma). (III) FORTRAN translations of the ALGOL programs MANDY and BARBARA. |

| *Vol.* | *Page* | | |
|---|---|---|---|
| 5 | 304 | E. Sheldon | Erratum notice. Computation of total, differential and double—differential cross sections for compound nuclear reactions of the type (a,b), (a,bgamma) and (a,bgamma—gamma). (III) FORTRAN translations of the ALGOL programs MANDY and BARBARA. |
| 6 | 99 | E. Sheldon | Computation of total and differential cross sections for compound nuclear reactions of the type (a,a), (a,a'), (a,b), (a,gamma), (a,gamma—gamma), (a,bgamma) and (a,bgamma—gamma). (IV) Fortran program CINDY. |
| 8 | 199 | E. Sheldon | MIA, a FORTRAN—IV program for making spin and parity assignments to high—lying single and coherent twin nuclear levels from (alpha, nucleon) angular distributions in on—resonance, compound—nuclear, channel—spin—1/2 reactions. |
| 7 | 1 | V.B. Sheorey | Chebyshev expansions for wave functions. |
| 2 | 201 | L.L. Shipman | High speed evaluation of F0(x). |
| 5 | 437 | P. Silvester | A finite element program package for axisymmetric scalar field problems. |
| 9 | 193 | P. Silvester | A finite element program package for axisymmetric vector field problems. |
| 10 | 421 | P. Silvester | A finite element program package for magnetotelluric modelling. |
| 1 | 445 | A.L. Sinfailam | Electron scattering by closed shell diatomic molecules. |
| 7 | 392 | R. Skoog | Nuclear energy loss and scattering of ions penetrating thin layers of matter. |
| 7 | 207 | W.R. Slaughter | Calculation of crystal potentials. |
| 7 | 389 | F. Smend | Form factor program for Rayleigh scattering of gamma rays by bound electrons. |
| 10 | 257 | F. Smend | Erratum notice. Form factor program for Rayleigh scattering of gamma rays by bound electrons. |
| 2 | 455 | U. Smilansky | Calculation of electric quadrupole radial matrix elements for Coulomb excitation. |
| 2 | 47 | F.J. Smith | Transport collision integrals for a dilute gas. |
| 2 | 173 | F.J. Smith | Erratum notice. Transport collision integrals for a dilute gas. |
| 4 | 149 | F.J. Smith | Book review. |
| 1 | 306 | K. Smith | A computer program for the calculation of electron scattering and photoionization cross sections of atomic systems with configuration (np)q. |
| 1 | 470 | K. Smith | Erratum. A computer program for the calculation of electron scattering and photoionization cross sections of atomic systems with configuration (np)q. |
| 3 | 277 | K. Smith | DIRAC, dynamic information retrieval of atomic codes. I. Physical design criteria. |
| 6 | 165 | K. Smith | Dynamic information retrieval of atomic codes II. Implementation. |
| 10 | 117 | K. Smith | TLASER — a CO2 laser kinetics code. |
| 5 | 80 | R.L. Smith | Program for evaluation of non—exchange type integrals required in electron—atom scattering theory using Slater—type orbitals as basis functions. |

| *Vol.* | *Page* | | |
|---|---|---|---|
| 5 | 456 | R.L. Smith | Program for calculating differential and integral cross sections for quantum mechanical scattering problems from reactance or transition matrices. |
| 7 | 172 | R.L. Smith | Program ACRL to calculate differential and integral cross sections adapted to run on IBM computers. |
| 7 | 177 | R.L. Smith | Erratum. Program for calculating differential and integral cross sections for quantum mechanical scattering problems from reactance or transition matrices. |
| 8 | 332 | R.L. Smith | Erratum notice. Program for evaluation of non—exchange type integrals required in electron—atom scattering theory using Slater—type orbitals as basis functions. |
| 10 | 73 | V.H. Smith Jr. | A strategy for the numerical evaluation of Fourier sine and cosine transforms to controlled accuracy. |
| 10 | 80 | V.H. Smith Jr. | Ring and other contributions to the higher virial coefficients. |
| 10 | 438 | V.H. Smith Jr. | Erratum. Ring and other contributions to the higher virial coefficients. |
| 1 | 55 | W.R. Smith | Nuclear bound state wave function subroutine. |
| 1 | 106 | W.R. Smith | Nuclear penetrability and phase shift subroutine. |
| 1 | 135 | W.R. Smith | Parameter search subroutine. |
| 1 | 181 | W.R. Smith | Hauser—Feshbach nuclear scattering subroutine LIANA. |
| 1 | 198 | W.R. Smith | Nuclear elastic scattering program with parameter search. |
| 2 | 394 | J.N. Snyder | A track matching program for bubble chamber photographs. |
| 5 | 48 | V.V. Sobolev | Some numerical investigations in nonlinear optics. |
| 3 | 53 | M. Sotona | Generalized transformation brackets for the harmonic oscillator functions. |
| 5 | 115 | B. Soucek | Applications of computers and mathematical models to the study of neuronal systems. Nuclear and neuronal pulse spectrometry. |
| 5 | 104 | L. Speet | Many—particle interaction problems computed by special purpose processors, with emphasis on the Ising model. |
| 9 | 11 | N. Spencer | COCHASE, a code for coupled channel Schrodinger equations. |
| 3 | 69 | T.H. Spurling | On the computation of third virial coefficients. |
| 10 | 98 | W. Squire | Inversion of Abel's integral equation by a direct method. |
| 4 | 47 | T. Stanev | Simple Monte Carlo simulation for solving methodological problems of detecting the extensive air showers electron component. |
| 2 | 191 | G.E. Stedman | Lanthanide crystal field fitting routine. |
| 8 | 377 | J.W. Steed | Coulomb wave functions for all real eta and rho. |
| 3 | 9 | D.W. Steinhaus | Calculation of atomic energy level values. |
| 3 | 19 | D.W. Steinhaus | Wave number calculation from least—squares level values. |
| 9 | 337 | J. Steuerwald | A contribution to the efficient solution of extensive symbolic computations. |
| 7 | 63 | N.F. Stewart | Computation of area preserving mappings. |
| 4 | 294 | C. Stolze | Automatic measurement of streamer chamber pictures. |

| *Vol.* | *Page* | | |
|---|---|---|---|
| 1 | 35 | R.M. Strang | Computation of total, differential, and double—differential cross sections for compound nuclear reactions of the type (a,b), (a,bgamma) and (a,bgamma—gamma) (II) Generalized programs MANDY and BARBARA for arbitrary angular momenta in Hauser—Feshbach—Moldauer formalism. |
| 1 | 224 | R.M. Strang | Erratum. Computation of total, differential, and double—differential cross sections for compound nuclear reactions of the type (a,b), (a,bgamma) and (a,bgamma—gamma) (II) Generalized programs MANDY and BARBARA for arbitrary angular momenta in Hauser—Feshbach—Moldauer formalism. |
| 8 | 1 | H. Strubbe | Manual for SCHOONSCHIP. A CDC 6000/7000 program for symbolic evaluation of algebraic expressions. |
| 4 | 150 | L.H. Sutcliffe | Book review. |
| 7 | 151 | L.J. Swartzendruber | A flexible least squares routine for general Mossbauer effect spectra fitting. |
| 5 | 48 | V.S. Synakh | Some numerical investigations in nonlinear optics. |
| 9 | 271 | L.M. Taff | Two—level CAMAC handler software. |
| 10 | 262 | L.M. Taff | SPYing on real—time computers to improve performance. |
| 1 | 25 | T. Tamura | Coulomb functions for complex energies. |
| 1 | 337 | T. Tamura | Angular momentum coupling coefficients. |
| 2 | 94 | T. Tamura | Distorted wave Born approximation for nuclear reactions. |
| 2 | 174 | T. Tamura | Erratum notice. Angular momentum coupling coefficients. |
| 3 | 73 | T. Tamura | Coulomb functions in entire (eta,rho)—plane. |
| 3 | 275 | T. Tamura | Erratum notice. Distorted wave Born approximation for nuclear reactions. |
| 3 | 276 | T. Tamura | Erratum notice. Coulomb functions for complex energies. |
| 8 | 349 | T. Tamura | Exact finite range DWBA calculations for heavy—ion induced nuclear reactions. |
| 10 | 87 | T. Tamura | Calculations of harmonic oscillator brackets. |
| 1 | 97 | C. Tate | A program for calculating Regge trajectories in potential scattering. |
| 6 | 316 | H.S. Taylor | Analytical and numerical procedures in the application of many—body Green's function methods to electron—atom scattering problems. |
| 4 | 95 | J.C. Taylor | Computer simulation of anisotropic magnetoplasma systems in cylindrical and toroidal geometry. |
| 8 | 149 | K.T. Taylor | A general program to calculate atomic continuum processes using the R—matrix method. |
| 5 | 11 | V.A. Tayursky | Numerical experiments on the statistical behaviour of dynamical systems with a few degrees of freedom. |
| 6 | 221 | J. Tellinghuisen | A fast quadrature method for computing diatomic RKR potential curves. |
| 2 | 261 | A.L.V. Tench | A program for calculating the static interaction potential between an electron and a diatomic molecule. |
| 5 | 396 | A.L.V. Tench | Erratum notice. A program for calculating the static interaction potential between an electron and a diatomic molecule. |

| *Vol.* | *Page* | | |
|---|---|---|---|
| 10 | 73 | A.J. Thakkar | A strategy for the numerical evaluation of Fourier sine and cosine transforms to controlled accuracy. |
| 10 | 80 | A.J. Thakkar | Ring and other contributions to the higher virial coefficients. |
| 10 | 438 | A.J. Thakkar | Erratum. Ring and other contributions to the higher virial coefficients. |
| 3s | 151 | H.C. Thomas | Computer programs in astrophysics. |
| 6 | 316 | L.D. Thomas | Analytical and numerical procedures in the application of many—body Green's function methods to electron—atom scattering problems. |
| 5 | 69 | W.J. Thompson | A nuclear optical model code for small computers. |
| 7 | 343 | W.J. Thompson | A version of a nuclear optical model code for small computers designed to run on a PDP—15. |
| 10 | 117 | R.M. Thomson | TLASER — a CO2 laser kinetics code. |
| 5 | 51 | A.A. Tomasin | A computer simulation of the Adriatic sea for the study of its dynamics and for the forecasting of floods in the town of Venice. |
| 5 | 32 | I.M. Torrens | Computer simulation in radiation damage studies. |
| 4 | 27 | J.J. Torsti | Some physical applications of the solution of ill—conditioned systems of linear equations. |
| 5 | 56 | J.V. Trotman | A program for closed orbit minimization by analytic technique. |
| 10 | 11 | F. Troyon | THALIA — a one—dimensional magnetohydrodynamic stability program using the method of finite elements. |
| 5 | 80 | D.G. Truhlar | Program for evaluation of non—exchange type integrals required in electron—atom scattering theory using Slater—type orbitals as basis functions. |
| 5 | 456 | D.G. Truhlar | Program for calculating differential and integral cross sections for quantum mechanical scattering problems from reactance or transition matrices. |
| 7 | 172 | D.G. Truhlar | Program ACRL to calculate differential and integral cross sections adapted to run on IBM computers. |
| 7 | 177 | D.G. Truhlar | Erratum. Program for calculating differential and integral cross sections for quantum mechanical scattering problems from reactance or transition matrices. |
| 8 | 332 | D.G. Truhlar | Erratum notice. Program for evaluation of non—exchange type integrals required in electron—atom scattering theory using Slater—type orbitals as basis functions. |
| 9 | 327 | D.G. Truhlar | Continuum exchange integrals for algebraic variational calculations of electron—atom scattering using Slater—type orbitals as basis functions. |
| 2 | 322 | T.A. Tumolillo | Computer analysis of Mossbauer spectra. |
| 5 | 225 | T.A. Tumolillo | Computer simulations of Mossbauer spectra for an effective spin S—1/2 Hamiltonian. |
| 5 | 395 | T.A. Tumolillo | Erratum notice. Computer simulations of Mossbauer spectra for an effective spin S—1/2 Hamiltonian. |
| 4 | 299 | M.J.L. Turner | A method for the automatic analysis of gamma ray events in astronomical spark chambers. |

| *Vol.* | *Page* | | |
|---|---|---|---|
| 7 | 135 | E. Vaccari | Design criteria for a general purpose high—energy physics experiment simulation program. |
| 7 | 163 | J. Van den Bos | A programming package for the calculation of cross—sections and probabilities for charge—exchange processes. |
| 3 | 42 | A. van der Meulen | Trajectory calculations for the reaction K+HBr — KBr+H in the eV—region. |
| 5 | 104 | E. Van der Schee | Many—particle interaction problems computed by special purpose processors, with emphasis on the Ising model. |
| 3s | 127 | W. van Haeringen | Computation of electronic properties of solids. |
| 1 | 425 | L. Van Hove | A Monte Carlo generation method with importance sampling for high energy collisions of hadrons. |
| 6 | 245 | H. Van Regemorter | Preface. |
| 5 | 104 | B.P.Th. Veltman | Many—particle interaction problems computed by special purpose processors, with emphasis on the Ising model. |
| 3s | 75 | M. Veltman | Algebraic techniques. |
| 3s | 157 | M. Veltman | Panel discussion, high—energy physics. |
| 4 | 289 | V.I. Vinogradov | Application of multi—users on—line system to nuclear and solid—state physics at Gatchina's reactor WWR—M. |
| 4 | 128 | P. Violino | A program for computing level crossings and the Back—Goudsmit effect. |
| 4 | 299 | U. Volonte | A method for the automatic analysis of gamma ray events in astronomical spark chambers. |
| 7 | 13 | P.L. von Behren | FORTRAN program to calculate finite—range no—recoil DWBA transfer cross sections. |
| 5 | 309 | E.D. von Meerwall | Automatic peak analysis on minicomputers. |
| 7 | 115 | E.D. von Meerwall | Automatic spectrum analysis on minicomputers: doublet resolution by gaussian fit. |
| 9 | 117 | E.D. von Meerwall | A least—squares spectral curve fitting routine for strongly overlapping lorentzians or gaussians. |
| 9 | 351 | E.D. von Meerwall | A FORTRAN code for automatic spectrum analysis on medium—scale computers. |
| 10 | 145 | E.D. von Meerwall | A general—purpose routine for the analysis of spectroscopic peak shapes. |
| 10 | 182 | B.T. Waak | Solution of bound state problems in nuclear shell model with momentum dependent potentials. |
| 2 | 107 | J.T. Waber | Relativistic self—consistent field program for atoms and ions. |
| 2 | 471 | J.T. Waber | Erratum notice. Relativistic self—consistent field program for atoms and ions. |
| 9 | 129 | J.T. Waber | Erratum notice. Relativistic self—consistent field program for atoms and ions. |
| 6 | 96 | A.E.A. Warburton | Book review. |
| 3 | 88 | J.L. Warren | Group—theoretical analysis of lattice vibrations. |

| *Vol.* | *Page* | | |
|---|---|---|---|
| 4 | 382 | J.L. Warren | Erratum. Group—theoretical analysis of lattice vibrations. |
| 8 | 71 | J.L. Warren | Improved version of group—theoretical analysis of lattice dynamics. |
| 5 | 44 | C. Weber | The use of computers in electron— and ion—gun design. |
| 4 | 10 | J.H. Weiner | Numerical solution of the time—dependent Schrodinger equation. |
| 4 | 339 | N.O. Weiss | Convection in the presence of magnetic fields. |
| 6 | 198 | N.O. Weiss | Difference methods for time—dependent two—dimensional convection. |
| 4 | 315 | J. Wells | Recognition of bubble chamber events exemplified by the Heidelberg automatic system. |
| 8 | 143 | N. West | BATMAN — an automatic batch processing system. |
| 2 | 40 | J.B. Whitworth | Computer—assisted analysis of gamma—ray spectra. |
| 4 | 268 | G. Wiechers | Vector coupling coefficients as products of prime factors. |
| 1 | 349 | I.R. Williams | I. Program for calculating degenerate Raman bands of symmetric tops with an adaptation for infrared bands. |
| 1 | 465 | I.R. Williams | Program for fitting transition energies into a level scheme according to the combination principle. |
| 2 | 87 | I.R. Williams | II. Program for calculating triply degenerate Raman bands of spherical tops with an adaptation for infrared bands. |
| 2 | 298 | I.R. Williams | I. A FORTRAN program for calculating degenerate Raman bands of symmetric tops with an adaptation for infrared bands. |
| 2 | 299 | I.R. Williams | II. A FORTRAN program for calculating degenerate Raman bands of spherical tops with an adaptation for infrared bands. |
| 2 | 381 | J.G. Wills | On the evaluation of angular momentum coupling coefficients. |
| 4 | 51 | R.D. Wills | Application of the Monte Carlo method to the calibration of detectors for gamma—ray astronomy. |
| 2 | 114 | J.McB. Wilson | Classical relative motion of 2 particles. |
| 3 | 180 | J.McB. Wilson | Stirling FORDOC 01. A set of documentation conventions for FORTRAN packages and routines. |
| 3 | 197 | J.McB. Wilson | Classical relative motion of 2 particles (EVAR edition 02). |
| 3 | 221 | J.McB. Wilson | Classical motion of 2 particles (EVA2 edition 01). |
| 7 | 151 | W. Wilson | A flexible least squares routine for general Mossbauer effect spectra fitting. |
| 1 | 425 | W. Wojcik | A Monte Carlo generation method with importance sampling for high energy collisions of hadrons. |
| 2 | 443 | A. Wolfram | Kinematical parameters of nuclear reactions. |
| 3 | 73 | H.H. Wolter | Coulomb functions in entire (eta,rho)—plane. |
| 6 | 1 | H.C. Wong | Computer generation of Feynman diagrams for perturbation theory. I. General algorithm. |
| 6 | 9 | H.C. Wong | Computer generation of Feynman diagrams for perturbation theory. II.Program description. |
| 7 | 73 | J.H. Wood | A non—relativistic SCF atomic program to compute one—electron energies, total energies, and Slater integrals. |
| 10 | 434 | J.H. Wood | Erratum notice. A non—relativistic SCF atomic program to compute one—electron energies, total energies and Slater integrals. |

| *Vol.* | *Page* | | |
|---|---|---|---|
| 1 | 281 | R.F. Wood | The Madelung potential and electric field intensity for a sodium chloride and for a caesium chloride lattice. |
| 3 | 88 | T.G. Worlton | Group—theoretical analysis of lattice vibrations. |
| 4 | 249 | T.G. Worlton | External modes of molecular crystals. |
| 4 | 382 | T.G. Worlton | Erratum. Group—theoretical analysis of lattice vibrations. |
| 6 | 149 | T.G. Worlton | Irreducible multiplier representations. |
| 8 | 71 | T.G. Worlton | Improved version of group—theoretical analysis of lattice dynamics. |
| 8 | 141 | T.G. Worlton | Erratum notice. Irreducible multiplier representations. |
| 6 | 316 | B.S. Yarlagadda | Analytical and numerical procedures in the application of many—body Green's function methods to electron—atom scattering problems. |
| 2 | 175 | A.C. Yates | A program for calculating relativistic elastic electron—atom collision data. |
| 5 | 1 | N.J. Zabusky | Solitons and energy transport in nonlinear lattices. |
| 3s | 50 | B. Zacharov | Development of computer systems in physics. |
| 7 | 175 | B. Zacharov | Book review. |
| 5 | 48 | V.E. Zakharov | Some numerical investigations in nonlinear optics. |
| 3s | 63 | P. Zanella | Machine recognition of patterns in particle physics. |
| 1 | 113 | R.N. Zare | Relativistic and non—relativistic configuration interaction calculations for atoms having a closed core and two valence spin—orbitals. |
| 4 | 182 | E.P. Zhidkov | New mathematical methods for analysing some nonlinear physics problems with the aid of a computer. |
| 3s | 157 | A. Zichichi | Panel discussion, high—energy physics. |
| 3 | 61 | O. Zohni | A Fortran program for the computation of the generalized Talmi coefficients. |
| 5 | 400 | J. Zoll | Software concepts for large application programs. |